July 26, 1948

STEEL

The Magazine of Metalworking and Metalproducing

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EDITORIAL INDEX, PAGE 29

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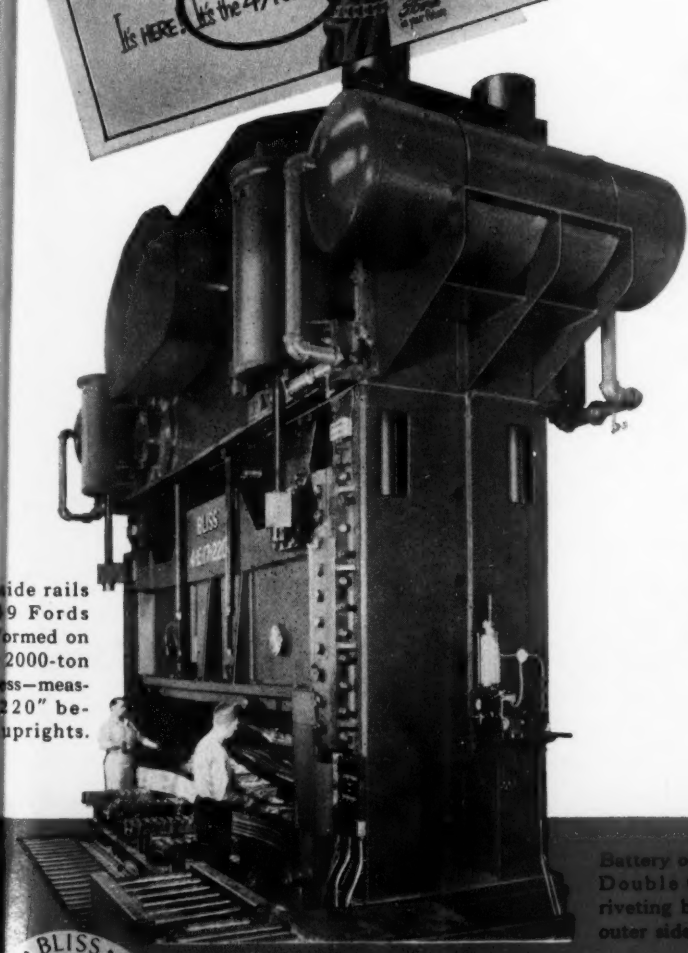

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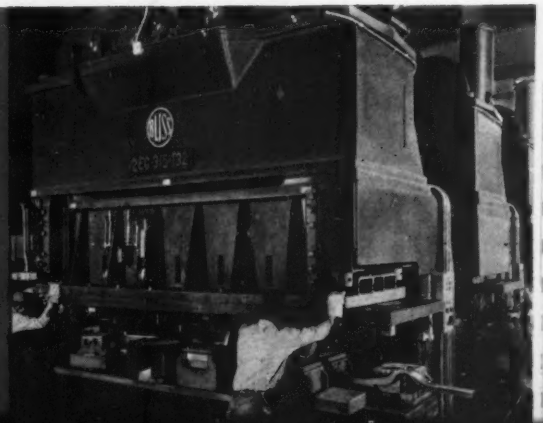

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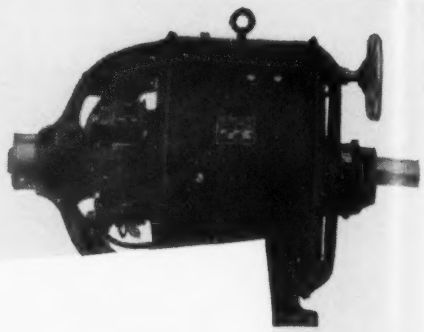

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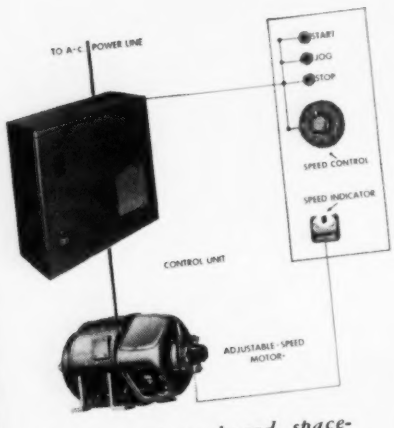

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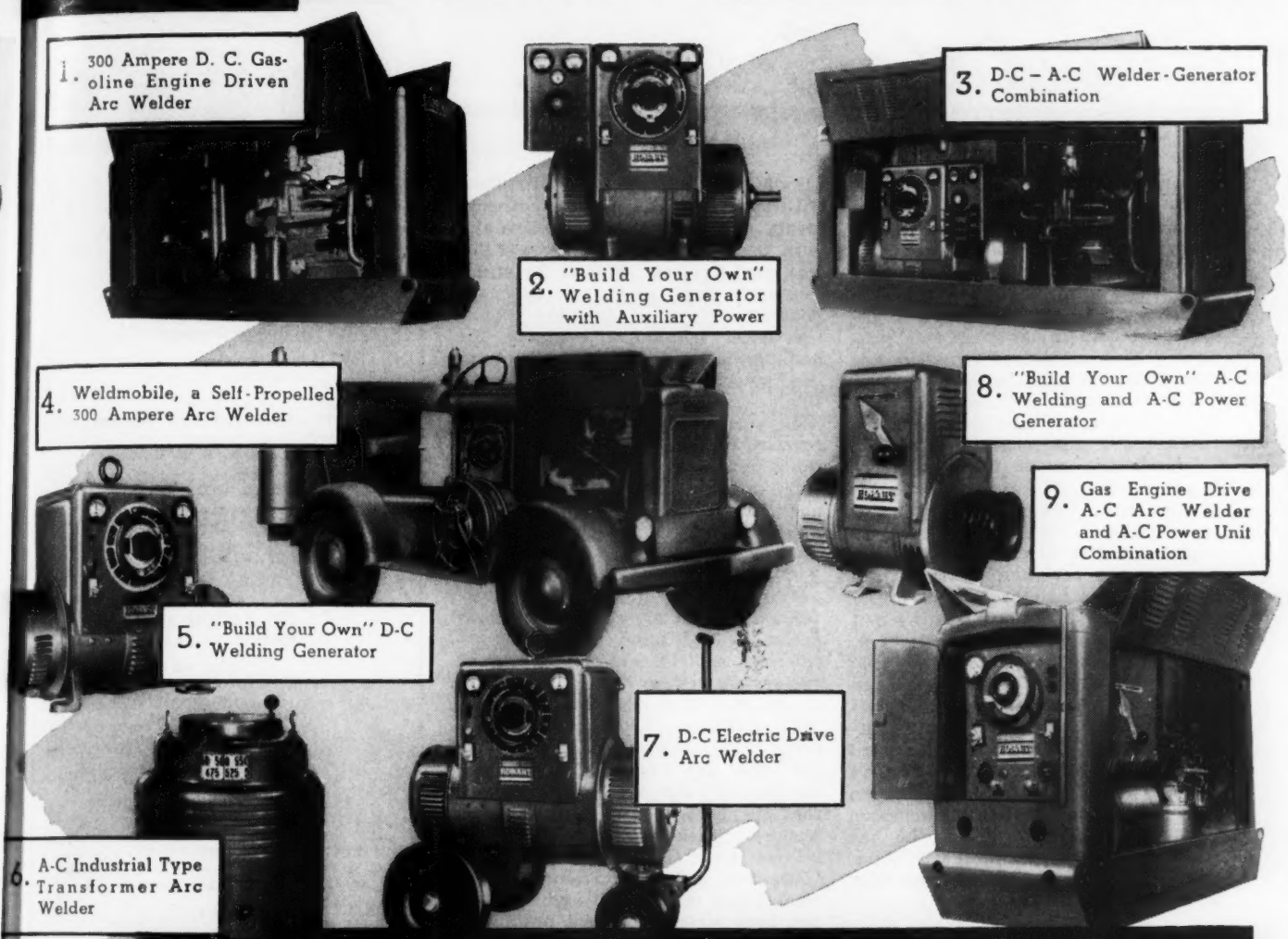
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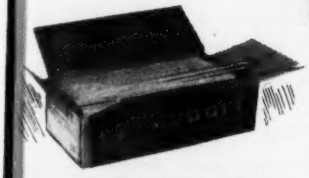

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Behind the Scenes...

F.O.B. Insanity

So far all the hubbub and hullabaloo about the demise of the basing point system and the shift to f.o.b. mill prices on steel has been in lofty terms, such as the dislocation of industry, effects on our great steel producing centers, and so on. The political aspects have been under considerable discussion (there ought to be a law, etc.) and the economic results have been tossed pro and con. A purchasing agent friend of ours, however, says that as far as he is concerned, all this noise is just noise. He says, and we think he may be slightly biased, that the purchasing agent is the real hero of the situation. He has had to burn a lot of midnight oil, not only figuring out how much his steel is currently costing him, but how much it would cost if he were able to buy it from a heck of a lot of mills which haven't anything to sell, just on the offchance that they might be interested in his business now that they don't have to absorb any freight. He says that it is only with a tremendous amount of self control that he has thus far restrained himself from carving up a few steel salesmen with a dull butcher knife.

Others, Too, Are Thieves

From time to time we quote from the "Houghton Line" in this column, because we really appreciate some of the logic in "Line Logic". Little things like, "A woman's greatest asset is a man's imagination". We are happy to note that other people also pick up stuff from the Line and quote it, too, because last night we swiped our dear wife's copy of the *Ladies Home Journal* and discovered in among the recipes and romance a pertinent quote from that esteemed little booklet.

Stainless from Hunger

We are practically starving to death as we write these words, having just come upon the Barbekitchen. That item, to those who are unfortunate enough not to have seen it in the current issue of "Steel Horizons", is the outdoor barbecue to end all backyard cooking discussions forever. It's a combination of stone and stainless guaranteed to make anybody long for a beautiful summer evening and a few complete installations of two-pound sirloin steaks. This outdoor job is fully equipped, with a double-bowl stainless sink, two charcoal grills, one with a turnspit and the other with a solid griddle top, a log-burning fireplace with stainless andirons and pothook, plenty of stainless work surface and even some fluorescent lights in stainless steel fixtures. Behind the stainless steel doors of the storage cupboards there are probably some stainless steel containers, suitable for holding martinis poured from a stainless steel cocktail shaker. As we think of our postage-stamp sized back yard, we are certainly looking forward to the day when this sort of thing reaches the mass production stage and is offered in many sizes and styles. Then we'll be in the market for a 2-hot dog version.

4 Times 2 Equals 16

Some of the more sprightly characters around town have taken to wearing jackets and slacks almost exclusively. They never match, of course, and in fact it seems to make little difference whether they even come close. We asked one of them the other day why this sudden play on un-matching outfits. He replied that the high cost of suits was the answer. With four suits, it seems, all you have is four different suits. With four jackets and four pairs of slacks, this school of thought argues, you have sixteen different outfits for the same amount of money. We haven't bothered to figure it out, but there seems to be some reason involved, no matter how unreasonable the combinations may look.

Puzzle Corner

R. B. Howlett of the Macklin Co. says that our executive of two weeks ago was either a cheap skate who figured on doing Paris for $106.52 or he was going whole hog and wanted $10,652. Either way, we figure his secretary was probably the kind of gal who knew him well enough to get the right amount figured out, which was certainly one or the other of those two amounts. W. W. Johnson of National Acme sent in the answer to the coin weighing problem, and along with it a problem, which goes like this: Teacher wrote two proper fractions on the blackboard, and then she asked two of the students to add them, each student to invert one of the fractions before adding. As it happened, each chose a different one to invert, and the answers they got were 2 and 2¼. What were the two original fractions?

Shrdlu

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STEEL

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Editorial Staff on Contents Page

July 26, 1948

Don't Be Stampeded!

One manufacturer has announced plans to move his plant from Indianapolis to Hammond, Ind., because of the adoption of mill pricing for steel. It is rumored that a large Detroit auto parts maker is considering establishment of a plant in the Pittsburgh area for the same reason.

In a few instances circumstances may be such that the shifting from basing point to mill pricing for steel constitutes sound justification for changing plant location quickly and even temporarily. However, in most cases moving a plant at this time would be premature for the reason that the present system of mill pricing is purely tentative.

Nobody knows yet what form mill prices will take after the inevitable shakedown has occurred. A week ago the trade was talking of f.o.b. mill prices as the base. Today it is clear that in the minds of some sellers mill prices are base, to which handling or other charges may be added to arrive at f.o.b. mill prices.

This is one of many technicalities which are bound to arise in the evolution of a mill pricing system. The mode of transportation presents interesting possibilities for variations in the method by which delivered prices will be derived from mill prices. No one can predict what refinements day-to-day experience will bring to the pricing pattern.

Another factor to be considered is the attitude of Congress. If early experience with the new prices arouses loud protest from steel buyers, the lawmakers probably will act to nullify or modify the effect of recent Supreme Court decisions. Whatever action Congress will take, if any, will depend somewhat upon the outcome of the Capehart investigation.

The mill pricing system now being launched is the first phase of a new era in pricing. Mill prices, as understood today, give no reliable hint as to what price formula will be in use six months, a year or two years from now. It seems incredible that manufacturers, except in rare cases, will want to move plants as long as the price pattern is so tentative.

While being alert to every price development, steel buyers should not be stampeded into hasty action. They can afford to give the new pricing time to jell.

* * *

THIRD ROUND WAGES: Last week leading steel companies advanced wages about 9 per cent. This was the first time since the steelmakers have dealt with the unions that the increase has been on a percentage, rather than a straight across the board, basis.

Hourly increases ranged from 9½ cents for common labor to 25 cents for the highest paid skilled employees. The average increase was about 13 cents per hour. These latest advances lift the wage for common labor to $1.185 per hour and the average to above $1.70.

It is significant that the advances granted in the three rounds of postwar wage negotiations account for more than a quarter of today's wage rates. Wages for common labor were upped 18½ cents in the first round in 1946, 12½ cents in the second round in 1947 and 9½ cents in the current third round—a total of 40½ cents. Average hourly rates increased 18½, 12½ and 13 cents, respectively, in the same rounds—a total of 44 cents.

During the past 33 years wages in the steel industry have been changed 26 times. In 21

(OVER)

times the change has been an advance and on five occasions it was a reduction. Changes were most frequent before and after World War I, at the beginning of the depression and following World War II. The longest period during which wages remained unchanged was 8 years —from August 1923 to October 1931.

The wide variations in frequency of wage adjustment argue strongly for a periodic review of wages which would tend to time changes more realistically. —pp. 37, 38

* * *

LISTS DEFENSE NEEDS: National defense needs are assuming more tangible form. **The Air Force and the Navy Bureau of Aeronautics have drafted procurement schedules for the first bite in the 70-group aircraft program.**

Air Force will order 2201 planes, deliveries to start next year and run into 1950. The Navy bureau will order 1165 planes. The two schedules involve more than a dozen prospective plane building contractors and will affect hundreds of materials, parts and equipment suppliers.

Meanwhile steel industry representatives have approved a voluntary allocation plan submitted by the Office of Industry Co-operation under which 1.2 million tons of steel will be channeled to government defense contractors during the next 12 months. This tonnage represents about 2 per cent of overall steel production. Last year steel going into military use accounted for about 1.25 per cent of total output. —pp. 42, 43

* * *

AWKWARD SITUATION: Controversy over the proposed allocation of 59,000 tons of sheet steel for prefabricated housing illustrates the embarrassing complications which arise when government edges into private business.

Major recipient of this steel would be Lustron Corp. Under the Veterans Emergency Housing Act, Reconstruction Finance Corp. has advanced Lustron $25.5 million. If Lustron is to repay this loan, it must have steel with which to produce housing and earn a profit. Some consumers, objecting to allocating steel to Lustron, contend that the tonnage in question will provide more housing if put into orthodox construction and equipment than if put into prefabs. The government's concern over its $25.5 million loan runs counter to its goal to expand housing.

Another factor is involved. Long before Lustron entered the scene, dozens of steel producers and fabricators spent millions in pioneering to introduce more steel into house construction. In the future—with the Lustron and similar government fostered or subsidized experiments in the background—will private companies be as willing as in the past to undertake costly pioneering work unaided? —p. 46

* * *

INEVITABLE HAPPENS: Since May, when the automobile industry granted substantial wage increases, it has been increasingly apparent that the previous effort of U. S. Steel, General Electric and others to halt inflation was doomed to fail and that a new upsurge in prices would ensue.

The inevitable has occurred. U. S. Steel Corp. subsidiaries and other steel companies are wiping out the April reductions, averaging about $1.25 per ton, and in addition are increasing the price of most steel products by an average of about $8.09 a ton. This action, coupled with the recent shift to mill pricing, makes it difficult to quote market prices intelligently.

Higher steel prices reflect not only higher wages, but also higher costs for coal, freight and numerous other items. In spite of the current sharp increase, steel prices now are only 53 per cent higher than in 1939

—pp. 37, 123, 132

* * *

FORMS PIPE IN PRESS: Fort Pitt Bridge Works is in the pipe business on an unusual basis. At its Canonsburg, Pa., plant is a 36-foot press which was used originally to form bulkhead plates for oil tankers. This press has been converted to shape plates in cylindrical form in three strokes. The formed section goes into a specially designed welding mill where rolls hold the edges of the plate tightly together while they are welded by the submerged arc process.

The company already has shipped over 50,000 feet of 10¾-inch outside diameter surface casing pipe fabricated by this novel method. Present output of 250 feet per minute can be increased to more than 400 feet by revamping the facilities slightly.

Here is a demonstration of how ingenuity in improvising available equipment has resulted in new capacity for a now scarce product. —p.84

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

UP WAGES, UP PRICES— Long-anticipated steel wage and price adjustments last week became a fact. Following wage increases averaging about 9 per cent, and ranging generally from 9½ to 25 cents an hour, major steel producers raised prices substantially. U. S. Steel restored the price reduction made last April and added 9.6 per cent to quotations then prevailing. With some variations, other producers followed suit. Increases on the bulk of finished products fall in the range of $10 to $14 a ton (p.37) with an overall range of from $1 to $17. These increases, combined with the freight costs which the buyer must pay as result of the industry's shift to a mill pricing system, will jump costs of metalworking companies, necessitate upward adjustments in their prices.

TARGET FOR POLITICIANS— That the steel price increase will become the topic for much criticism in the special session of Congress is a foregone conclusion. One congressman already has announced he will launch an inquiry into the matter. It well may become a campaign issue as politicians seek a whipping boy to blame for inflation. For the record, it may be pointed out that the steel industry took the lead in a campaign last April to stabilize wages and reduce prices (p.37). And lest the administration forget, it virtually directed the first postwar wage increase of 18½ cents an hour, which many believe started the wage-price spiral.

PRICING SHIFT— Steel consumers still have many questions to be answered as to the effects of the change from basing point to mill pricing (p.39). Clarification of this situation may take months or years. And there remains the chance that Congress will come forward with a definitive clarification of the legality of various pricing methods. Meanwhile, some plants are contemplating moving closer to their sources of supply (p.40). Pittsburgh, with a surplus of production, hopes to attract new metalworking companies (p.39). Plants located on navigable rivers may gain by the shift (p.40) even though located far from their supplying mills.

PREPAREDNESS— Steel industry representatives have approved voluntary allocations for a million and a quarter tons of steel for military needs over the next 12 months (p.42). The armed services are about ready (p.42) to place aircraft orders totaling $2 billion. Bureau of Mines in proceeding with a program to improve this country's self-sufficiency in minerals. Capacity of the U. S. fleet (p.43) is being examined.

AUTOMOBILES— Settlement of the tool and die workers strike is permitting resumption (p.51) of work on new models. Chrysler is looking forward to a changeover around the end of the year. General Motors may offer its new models this fall. Nash is closing for changeover. The production outlook, however, still is clouded by strikes in suppliers' plants and by a shortage of steel and pig iron.

INTERNATIONAL— Changes in the corporate organization of the German steel industry appear to be in the making (p.47) after a considerable period of hemming and hawing. The American steel commission in Germany is working to a large extent independently of the British and is aiming at improving the position of the Ruhr mills with the aid of foreign investments.

HERE AND THERE IN INDUSTRY— Cleveland Electric Illuminating Co. has asked industry in its area to go easy on power use during peak consumption periods (p.41) . . . Kearney & Trecker has purchased the Walker-Turner Co. (p.54) . . . Arco Co., whose lacquer building was destroyed by fire 18 weeks ago, is back in production in a quonset plant (p.54) . . . Douglas Aircraft has launched a new metal products division (pp.52, 62) which will supply pressed metal stampings to West Coast auto plants . . . . Imports into this country (p.48) are increasing . . . . Scrap prices, spurred by the boost in finished steel quotations, broke through the formula level (p.41) on steelmaking grades, advanced $2.50 per ton.

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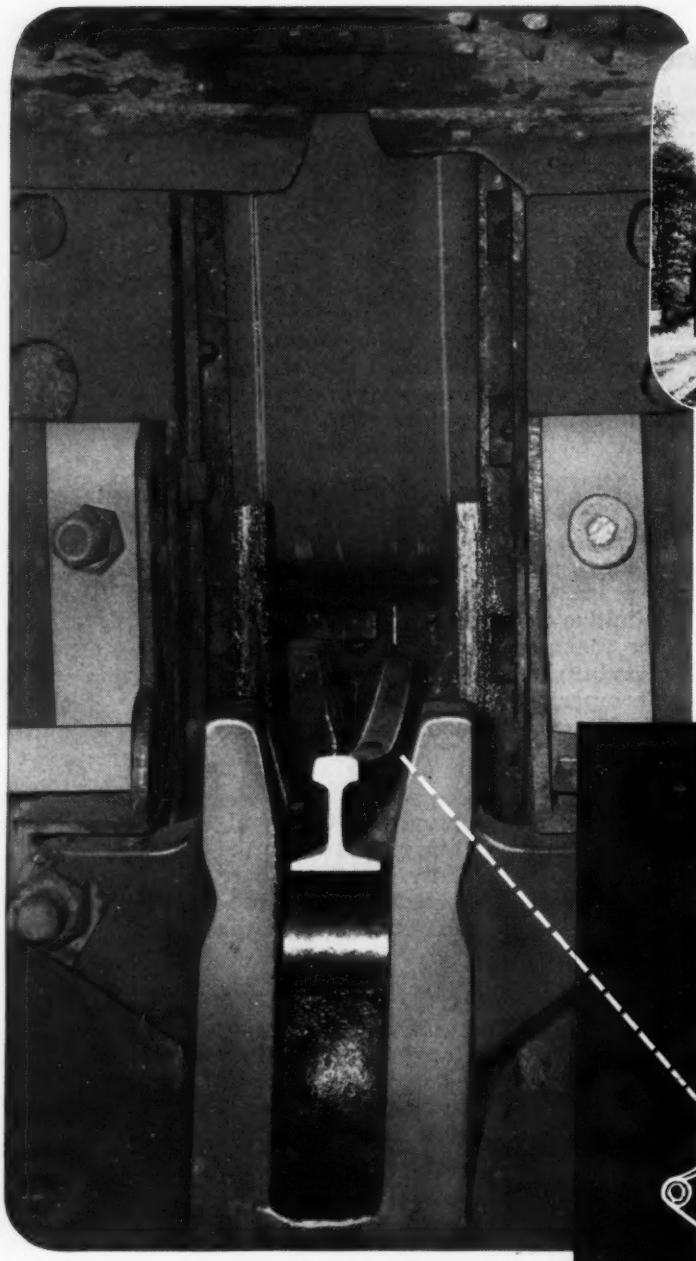
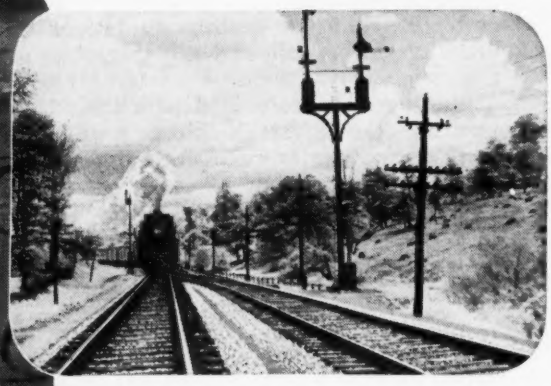


Rail test section, above, after being hammered by one-ton weight dropped from 22-foot height.



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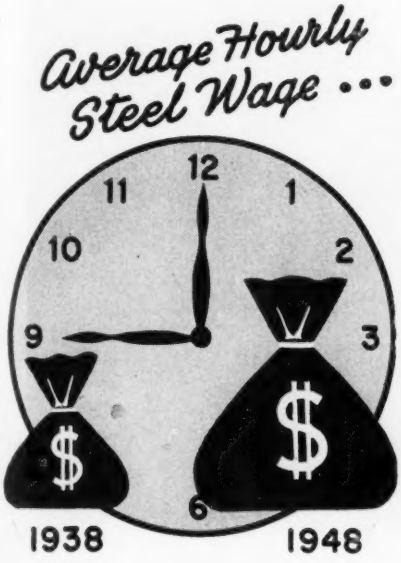
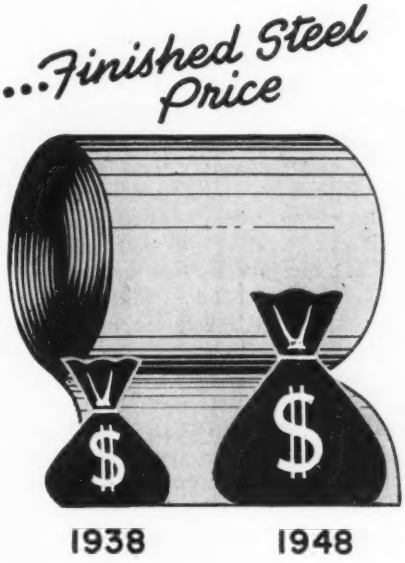


Goes Up Faster Than

YEAR	Average Hourly Steel Wage	Increase Over 1938	Composite Finished Steel Price	Change From 1938
1938	83.0c	.....	$62.18	....
1939	84.2	1.4%	56.73	— 8.7%
1940	85.0	2.5%	56.73	— 8.7%
1941	95.9	5.5%	56.73	— 8.7%
1942	105.6	22.3%	56.73	— 8.7%
1943	113.5	36.7%	56.73	— 8.7%
1944	121.9	46.9%	56.73	— 8.7%
1945	124.8	50.4%	56.73	— 8.7%
1946	134.7	62.3%	58.27	— 6.2%
1947	147.0	77.1%	69.82	+10.6%
1948 Before Increase	157.7	90.0%	80.27	+29.0%
1948 After Increase	170.7	105.6%	*86.82	*+39.6%

* Tentative.



Steel Price Boost To Lift Metalworking Costs

Many products advanced $10 to $14 a ton, with average increase figured at $9.34. Action necessitated by higher wages, freight rates, construction, coal, other material costs

THREE months ago Big Industry under the leadership of U. S. Steel, General Electric and others embarked on a noble experiment in industrial statesmanship—the halting of inflation.

The program was simple. Industry said: "We intend to hold wages at present levels, and reduce the prices of our products, in an attempt to arrest the rising cost of living and to bring about a greater national stability."

For some weeks the campaign appeared to have a chance at success. Important segments of industry announced adherence to it, refused demands for third round wage increases, and cut prices.

Dike Springs a Leak—But in May, the leading automaker succumbed to organized labor's pressure and granted a substantial wage increase. Other auto companies followed suit. Then the electrical, rubber and coal mining industries yielded to union pressure.

Higher wages brought higher prices and the battle against the third round of inflation was lost.

Last week the steel industry was completing the cycle. Desiring to treat its employees fairly, Big Steel gave its workers a generous 9 per cent wage increase, averaging 13 cents and ranging from 9½ to 25 cents an hour.

Up Wages, Up Prices—The higher wage costs, combined with increases in freight rates, construction costs, coal prices and advances in other materials, necessitated substantial upward adjustment in steel prices. On Wednesday, U. S. Steel wiped out the reductions it had effected in April and further increased its steel prices by about 9.6 per cent.

Indications are the remainder of the industry is following the corporation's lead in both wage and price adjustments, with some variations.

The steel price increase will raise costs of metalworking companies substantially and in many cases will require further adjustments in the prices of these companies.

Target for Washington—The steel increase can be expected to be the target for much criticism in Washington during the forthcoming political battle over who is to blame for inflation.

The same administration officials who in the fall of 1945 promoted the cause of inflation by assuring the labor unions that they were entitled to substantial wages increases at that time, who directed the first round settlement of 18½ cents an hour in 1946, and who sponsored the phoney statistics indicating industry could grant huge wage increases without advancing prices now will be pointing the finger at the steel industry.

The Price Advance

PRICE increases announced by U. S. Steel subsidiaries range from $1 to $17 a ton, with a majority of the finished products most in demand ranging from $10 to $14 a ton. They embrace a restoration of the average price reductions of about $1.25 a ton made last April and in addition include an average increase of about $8.09 a ton, or 9.6 per cent in the base prices then quoted.

Hot-rolled carbon sheets and strip were advanced $10 a ton. Cold-rolled sheets and strip are up $11. Galvanized and galvannealed sheets are $11 higher and electrical grade sheets were advanced $15. Holloware enameling black plate is up $2.

Bars, structural shapes, plates, floor plates, CB sections and bearing piles have been marked up $10 a

ton. Reinforcing bars are up $13.

All rails, joint bars and tie plates advanced $10. Axles are $15 higher.

Manufacturers bright carbon wire, merchant wire and high-carbon spring wire are $14 higher. Flat wire is up $11. Wire rods are $12 higher. Nails and staples, barbed wire, woven fence and bale ties have been advanced 12 columns, or about $12 a ton. Fence posts moved forward 10 columns, or about $10 a ton.

Buttweld standard and line pipe, ½-in. to 3-in., seamless standard and line pipe and seamless casing are $10 higher. Seamless oil well tubing is up $11 for grades H-40 and J-55 and $15 for grade N-80. Seamless drill pipe is up $8. Seamless mechanical and pressure tubing will be adjusted proportionately.

Cor-Ten high-strength steels were advanced $15 on bars and small shapes, CB sections, structural shapes, hot and cold-rolled sheets and hot-rolled strip. Cor-Ten galvanized sheets are up $17.

Man-Ten products are up $10. Abrasion resisting plates, sheet and strip are up $10 and abrasion resisting bars are up $14.

Forging carbon ingots were marked up $4 a ton. Forging and rerolling quality carbon blooms, billets and slabs were advanced $7.

Alloy ingots, blooms, billets and slabs are now quoted on a net ton basis instead of the former gross ton basis. Alloy ingots are $51 a net ton, against the former $56 a gross ton, an increase of $1 a net ton. Alloy blooms, billets and slabs are $63 a net ton, against the former price of $66 a gross ton, an increase of about $4 a net ton.

Alloy hot-rolled bars and bar shapes are up $11, plates $14, structural shapes $12, and hot-rolled strip $10.

The Wage Advance

VOLUNTARY wage advance granted the United Steelworkers by U. S. Steel and most other steelmakers averages approximately 13 cents an hour, or about 9 per cent.

Increases range from 9½ cents an hour for the lowest paid workers to 25 cents an hour for the highest paid. The common labor rate now is $1.185 an hour.

Present labor contracts between the union and the companies generally are being extended for one year, to Apr. 30, 1950, with the right of reopening in July, 1949, for the purpose of negotiating wage rate changes and insurance benefits.

Granting of insurance benefits this summer reportedly was considered by the industry but was postponed until next year. This will give the union something to bargain for at the next reopening in case industry holds out against a fourth round wage advance.

NO PIPE DREAM: Tests are run on 26-in. seamless steel pipe, said to be largest ever produced, at the Lorain, O., plant of National Tube Co., U. S. Steel subsidiary

WAGES—How They Grew

AVERAGE hourly earnings in the steel industry today exceed $1.70 an hour. This is double the average earnings in 1940, and 6½ times the 26.3 cents an hour average drawn by steelworkers in 1914, prior to World War I.

Common labor rates have increased from 20 cents an hour in 1915 to $1.185. Following table shows the growth in common labor rates over the past 33 years.

	Hourly wage	Per cent advance over 1915
1915	20.0	...
Feb. 1, 1916	22.0	10.0
May 1, 1916	25.0	25.0
Dec. 15, 1916	27.5	37.5
May 1, 1917	30.0	50.0
Oct. 1, 1917	33.0	65.0
Apr. 16, 1918	38.0	90.0
Aug. 1, 1918	42.0	110.0
Oct. 1, 1918	46.2	131.0
Feb. 1, 1920	50.6	153.0
May 16, 1921	40.5	102.5
July 16, 1921	37.0	85.0
Aug. 29, 1921	30.0	50.0
Sept. 1, 1922	36.0	80.0
Apr. 16, 1923	40.0	100.0
Aug., 1923	44.0	120.0
Oct. 1, 1931	39.6	98.0
May 16, 1932	33.7	68.5
Aug. 19, 1933 (NRA code)	40.0	100.0
Apr. 1, 1934	44.0	120.0
Nov., 1936	52.5	162.0
March, 1937	62.5	212.5
April, 1941	72.5	262.5
July, 1942	78.0	290.0
February, 1946	96.5	392.5
April, 1947	109.0	445.0
July 16, 1948	118.5	492.5

Percentage Increase—For the first time since the industry has recognized the union, the wage increases were made on a percentage, rather than a flat across the board basis. In previous settlements, the unskilled worker has obtained the same increase granted the highly skilled employee. The latest settlement helps restore the spread between the common laborer and the expert workman.

Most steel companies are making proportionate adjustments in salaries.

Weirton Increase Larger—Weirton Steel Co., whose employees are represented by the Weirton Independent Union Inc., gave a slightly larger increase than those companies organized by the United Steelworkers. Weirton's increases range from 10 to 25 cents an hour and average 14 cents. Minimum rate is raised to $1.265 an hour, 8 cents above the majority of the industry.

Steelmaking Costs Up

TOTAL cost of the third round wage adjustments to the basic steel industry are estimated at close to $200 million a year. This figures out to about $3 a ton of finished steel produced under present near-capacity operations.

But steelmakers are quick to point out that wages are only one element in their rising costs.

Compared with 1936-39 average, raw materials have increased from 15 per cent (sulphur) to 461 per cent (palm oil). Coal and coke costs are up nearly 150 per cent, fuel oil

has advanced 175 per cent, heavy melting scrap 163 per cent.

Construction costs are from 73 to 153 per cent higher.

Freight rates are up 27 to 62 per cent in nine classifications.

A coke oven which cost $1 million to build before the war now costs $3 million. The cost of building a blast furnace has more than doubled. A hot sheet-strip mill requires an investment 96 per cent greater than in the late thirties.

Detroit Arbitraries Out

INCREASE in prices of all finished steel products was announced Wednesday by Great Lakes Steel Corp., Ecorse, Mich., after earlier changing to a mill pricing system, raising wages an average of 13 cents an hour and advancing salaries. George R. Fink, president, termed the higher prices "unavoidable" because of sharply higher costs.

In establishing mill prices, Great Lakes set a figure of $3.65 per hundred on cold-rolled sheets, for example, 20 cents a hundred or $4 a ton over the former Cleveland base price to which an arbitrary delivery charge of 21 cents a hundred or $4.20 per ton was added for shipment into the Detroit switching limits, and 28 cents a hundred or $5.60 per ton for eastern Michigan and Toledo. These arbitraries will no longer be in effect, and the new mill price, before the increase just announced, actually was 20 cents a ton lower than the Detroit delivered price.

Latest increases presumably will follow the pattern announced by United States Steel Corp., involving boosts on the order of $9-$11 per ton. Thus, the new delivered price for cold-rolled sheets to the automobile industry in Detroit, formerly $73.20 per ton, will be approximately $84 per ton, mill, plus a switching charge of 80-85 cents a ton.

Specific increase figures ranged from $9 a ton on hot-rolled carbon products, $11 on cold-rolled sheet and strip to $17 on NAX cold-rolled material.

As just one isolated example of what the higher steel costs will mean, the case is cited of the new Fisher Body stamping plant at Hamilton, O., which at peak will consume 30,000 tons of flat-rolled steel a month. Figuring new prices and freight charges, this plant will pay about $350,000 more per month for steel.

General Motors Corp. had been holding off increases in passenger car prices pending detailed cost studies, but the latest jump in steel makes mark-ups of $100-$200 per car almost certain.

"Information Please" Ask Steel Users

Questions without immediate answers posed by steel industry's shift to mill pricing. Clarification may be long in coming

QUESTIONS without immediate answers have been left in the wake of the steel industry's shift to mill pricing. As evidenced by letters and queries to STEEL, confusion and puzzlement have been the most immediate results from the change, conditions which in many instances may not be cleared up for some time to come.

Steel consumers have the most vexing questions in regard to their marketing problems: Is a zoning, basing point or any other delivered price system illegal under all circumstances? Is it necessary to go as far as the steel companies even if the basing point system is illegal? What will happen if an industry or part of it keeps its old pricing system? These and other questions still await clarification from decisions by the courts and the Federal Trade Commission.

More specific problems also plague the steel consumer. Typical is the predicament in which a Seattle fabricator of sheet metal and plate finds himself. Under the new mill pricing system, he may get his steel from Chicago, St. Louis and Cleveland at, for example, the average price of $85 per ton. By basing his own quotations to his customers on this average cost, he can quote on a rational basis. But what happens to his quotations when his procurement pattern fails and he has to set up a new one with Cleveland, Pittsburgh and Birmingham at an average ton cost of $90?

REPRINTS AVAILABLE

REPRINTS of "Guide for Steel Buyers Under New F. O. B. Pricing System," showing geographical location of facilities for producing principal steel products, which appeared in STEEL, pp.62-63, July 19, are available. Quantities of one to ten copies will be supplied free on request to Readers Service, STEEL, Cleveland 13, Ohio. Quotations on larger quantities supplied on request.

FTC Hearing in Recess

HEARINGS in the Federal Trade Commission's case against the steel industry were recessed July 16, following a request by Trial Attorney Lynn C. Paulson that the steel company respondents supply to him complete figures denoting capacity per finished product at each steel plant location, and that they supply data on certain basing points which were not included in the commission's original basing point chart.

These data are to be supplied by July 31; if not received by then the commission will issue subpoenas returnable Aug. 10. If the data are furnished as requested, then there is to be a recess until Sept. 8 when the government will resume its hearings. While steel respondents indicated their willingness to comply with the request for plant capacity figures, they were unwilling to report actual tonnage shipments from individual plants, which was the information that Mr. Paulson first requested.

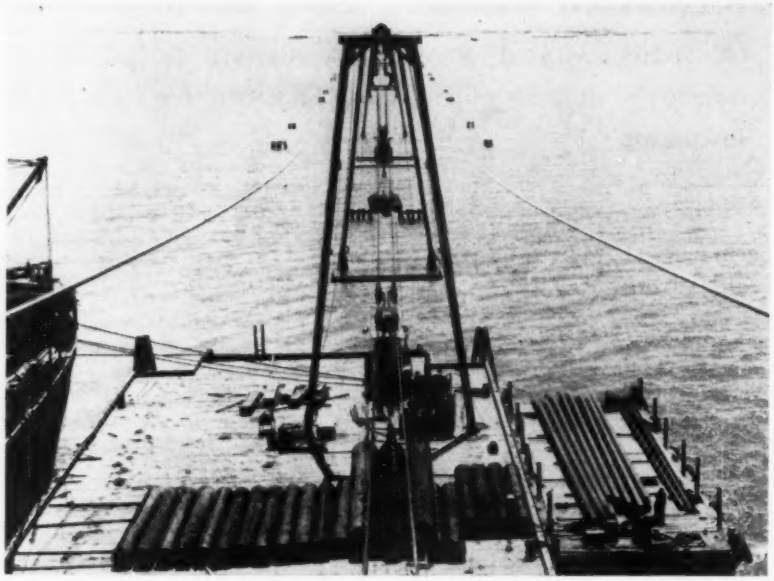
No Pricing Blues in Pittsburgh

ELIMINATION of the basing point system of pricing steel, which generally is supposed to be a severe blow to steel producing districts with production capacity in excess of local consumption, has not got Pittsburgh down. On the contrary, some Pittsburghers see in the change an opportunity for community growth industrially.

For one thing, it is pointed out that it is highly unlikely the demand for steel coming to Pittsburgh mills will materially shrink so long as present tight supply conditions prevail. Even when supply-demand balance is struck, it is claimed, consumers still will have to come to Pittsburgh for much of their requirements since most other steel producing districts are under-capacitated.

Some Pittsburgh steel executives grant that abandonment of basing point pricing may effectively curb further expansion of steelmaking facilities in the district, but even this thinking is not universal. Others feel sufficient fabricating industry can be attracted to the area not only to offset any loss of tonnage demand from distant points, but also to necessitate some expansion of steel producing facilities.

Last week various moves were under way in the area to attract



SKYHOOK: Possibly left-handed monkey wrenches were used in erecting this aerial tramway which connects a man-made island with the shore three miles away. When cargoes for the Trans-Arabian Pipe Line Co., Saufi, Arabia, could not be unloaded on shore, this equipment was built by Pointer-Williamette Co. using Roebling track cables. Here a shipment of pipe is being transported

fabricating industry. The Chamber of Commerce and other local groups were studying the matter, and it is reported the chamber has received inquiries from outside the area as to availability of plant sites. Specifically, Kelsey-Hayes Wheel Co., Detroit, automobile parts manufacturer, is reported considering a plant in Pittsburgh.

In addition to business programs for attracting industry, the city government is showing increased interest in development of terminal facilities for rail, river and truck transportation. Particular interest is being shown in the river project because of the lower freight rates via the Ohio and Mississippi rivers. It is understood the state of Pennsylvania now has studies for such river terminal facilities in the final stage.

Railroad reaction to this project has not been forthcoming, but proponents of the scheme say the railroads would lose freight anyway if Pittsburgh is allowed to lose its position as the leading steelmaking center.

Firm Moves Nearer Steel Source

GEOGRAPHIC magnet which many executives predicted would be energized by the shift to mill pricing in the steel industry has already worked in at least one instance. Monarch Steel Co., producer of cold-drawn shafting for the screw machine industry, is moving from Indianapolis to Hammond, Ind., in order to be next door to its source of hot-rolled steel bars.

Monarch explained that it costs 31 cents per 100 pounds to ship this material from Gary, Ind., its source, to Indianapolis, while the freight rate to Hammond is only 5 cents. Officials announced that the company had to move or else cease selling north of Indianapolis and in the East and West where much of its production now goes; the move is expected about Oct. 1.

River Cities May Benefit

A BOOM may be on the way for Ohio river cities, as well as for other cities located on inland waterways, as a result of the new mill pricing setup on steel. At least one company already is considering moving its operations to an Ohio river point and another may expand production at a branch plant. The reason: One typical Ohio river city enjoys about a 20-cent barge rate on steel from Pittsburgh or about one-third of the all-rail rate.

Opinions of Stampers Differ

QUERY by the Pressed Metal Institute as to the probable effect on stampings manufacturers of the elimination of the multiple basing point system of pricing sheet and strip last week had brought in 84 replies, with a majority opinion being that the change will not prove a serious handicap. Fifty-nine per cent thus reported. Another 37.3 per cent, however, expect the system's abandonment to impose a handicap on their business. Uncertain of the change's effects were 3.7 per cent of the reporting firms.

In reporting the results of this survey, Tom J. Smith Jr., PMI president, noted the wide divergence in stampers' viewpoints as to the consequences of the move and remarked that five fully integrated steel producers probably will suffer least and profit most from the change; nonintegrated mills will find the change less to their liking and the smaller they are the more unfavorable effect it will have.

Await Earnings Reports

EARNINGS of the steel industry for the period ended June 30 will be examined with more than usual interest in light of price and wage developments of the past two weeks. By late last week, however, none of the fully integrated producers had issued their reports. Most earnings statements will be released within the next 10 days.

Two steelmaking companies which have reported their earnings for the last six months—Rotary Electric Steel Co., Detroit, and Portsmouth Steel Corp., Portsmouth, O.—show mixed trends, Portsmouth's earnings being below the 1947 level and Rotary's being more than double the comparable 1947 figure.

Portsmouth Steel Corp.

NET earnings of Portsmouth Steel for the first half on sales of $27,558,832 were $1,933,460. Income in the comparable 1947 period was $2,033,679 on sales totaling $23,201,084. Second quarter income of the corporation was $904,915, compared with $1,024,359 in the like 1947 quarter.

Rotary Electric Steel Co.

FOR the six months ended June 30, Rotary had earnings of $1,098,353 on sales of $9,321,189. Deducted from its net profit was $150,000 as a reserve for plant replacement which reduced earnings to $948,353. This compared with 1947 first half earnings of $401,113 on sales of $7,992,532.

Hearings Close on NLRB Order

CIRCUIT Court of Appeals, Chicago, last week took under advisement a double appeal from the National Labor Relations Board order of Apr.

15 in the Inland Steel case. The board had ordered that Inland must bargain with United Steelworkers of America-CIO over pension and retirement policies provided that officers of the union file affidavits under the Taft-Hartley Act that they are not communists. Both the company and the union appealed this order, the former contending that it never before had discussed pension matters with the union and does not believe itself required by law to do so, and the latter arguing that the affidavit provision of the act is unconstitutional as it legislates against political beliefs.

During the proceedings Judge Sherman Minton declared: "Communism is not only a political belief but a course of action. It is common knowledge that communists joined unions to cause trouble, not to help the union, and Congress has a right to legislate against this."

Daytime Power Use Cut Asked

DEMAND for electric power in the North Central district where about 75 per cent of the country's steel producing capacity is located this winter will exceed, during normal working hours, the generating capacity of the area.

To help correct this imbalance, without causing loss of production among industrial firms, the company supplying power to Cleveland and its environs—Cleveland Electric Illuminating Co.—has asked 350 of the largest industrial users to reduce their consumption during peak-load periods by 15 per cent throughout the winter months Sept. 1 to May 1.

A comprehensive survey by the utility company determined that from 8 a. m. to 8 p. m. Monday through Friday during this period the anticipated demand would exceed supply. The company's suggestion to the industrial users is to revise their working schedules to include night and weekend hours. CEI, itself, will increase its use of power for operation and maintenance of its plants in off-peak periods.

A number of larger Cleveland manufacturing concerns are now making tries at reducing their power consumption during their regular working hours by close attention to light bulbs left burning unnecessarily during lunch periods, etc.

Certain maintenance operations requiring large amounts of electricity are being shifted to night hours. Through these economies they hope to avoid the inconvenience which shift in working hours might entail.

The utility company's expansion program, which in the last 34 months has cost $31.5 million and consists of additional generating capacity of 330,000 kw now on order, will result by September, 1949, in a 35 per cent increase in capacity. The impending peak-load power shortage this winter, thus, should be of only temporary concern.

Scrap Prices Rise

Steelmaking grades move up $2.50 over formula in wake of finished steel price advance

SCRAP prices followed closely on the heels in steel quotations in moving into high ground last week. Steelmaking grades were quoted at $2.50 a ton over the old formula, and buyers were forced to abandon their previous firm resistance to upward revision.

Some scrap dealers expect that unshipped tonnages against consumer contracts will be moved at the higher levels.

Formula prices generally have prevailed in steelmaking grades of scrap since last November.

British Bid Up German Scrap

DESPERATE need for scrap has prompted some Britons to offer German scrap dealers $30 a ton for heavy melting steel, f.a.s. north German ports. These offers, reported by U. S. Army spokesmen, are in violation of a recent British-American agrement to pay no more than $26 a ton.

General Lucius D. Clay, American military commander of occupied Germany, is understood to have stated Americans will not pay more than the agreed-to $26 and is insisting that the British withdraw their higher offers.

Chances of this attitude forcing the British to toe the scrap-price line are considered good and Washington is hopeful that the U. S. can soon close on substantial tonnages of Germany scrap for shipment to this country.

Nickel Price Advanced 5 Cents

CONTRACT price for electrolytic nickel from the Port Colborne, Ontario, refinery of Internationl Nickel Co. Inc. has been increased to 40c a pound, effective July 22. This price includes United States import duty. This was the quotation prevailing for many years prior to 1921. The price had been 35c a pound from November, 1946, to Jan. 1, 1948, when duty reduction caused a 1¼c per pound decrease.

Effective at the same time, the parent Canadian company, International Nickel Co. of Canada Ltd., announced like increases in refined nickel prices in Canada and the United Kingdom, keeping prices in the three markets at the identical level.

NO FIELD PIECE: Although this looks like a Long Tom, its purpose is constructive, not destructive. It is a 40-ft tube with a cutting tool bolted to its edge developed by Allis-Chalmers as a boring bar. It is inserted into a rotary kiln to cut fused materials adhering to the lining

Defense Contractors To Get Steel

Steel industry agrees to OIC voluntary plan to supply 1.2 million tons over next 12 months, at rate of 102,000 tons a month

STEEL industry representatives have approved a voluntary allocation plan submitted by the Office of Industry Cooperation under which 1.2 million tons of steel will be channeled to government defense contractors for arms production during the next 12 months.

Drawn up by military officials, the program will provide 102,000 tons of steel a month until next February when Public Law 395 expires. If it is renewed, the program will continue for the full 12 months. Incidentally, chances for the law's extension, perhaps at this special session of Congress, appear good. Major items in the program will include sheet steel and strip and hot and cold-rolled bars.

Tentative Breakdown — Tentative breakdown of products required is: Sheet and strip steel, 25 per cent; hot and cold-rolled bars, 20 per cent; structural shapes, 12 per cent; steel pipe, 11 per cent; ingots, 9 per cent. The balance is made up of such items as wire and steel castings. Most will go for Navy use, with the rest for the Army and Air Force. The 1.2 million-ton total represents about 2 per cent of overall steel production. Last year's military steel use was about 1.25 per cent of total production.

Voluntary allocation programs approved or soon to be approved will take 451,732 tons of steel monthly, leading some OIC men to believe the limit almost has been reached.

Before arms contractors can expect any orders, the following steps will be taken by the administration: 1. Public hearings, as required by law, to be held during the first week in August; 2. Justice Department clearing of program; 3. OIC task committee to start work allocating tonnages among the various co-operating steel producers according to capacity; 4. Placement of orders by the military. Shipbuilders, gunmakers and other steel users working on the defense contracts will be free to shop around for their steel.

Mineral Sufficiency Pushed

VISIT with Oliver C. Ralston, chief, Metallurgy Division, Bureau of Mines, reveals a program for fiscal 1949 devoted entirely to improving the country's self-sufficiency in materials. It is keyed in with a general government objective of preparing for another war emergency.

Chief projects are in connection with titanium and zirconium, both plentiful in the United States. Titanium is under study as a substitute for various compositions of stainless steel in order to reduce the need for nickel and chromium. Zirconium can be applied to many uses, principally

OLIVER C. RALSTON

as a substitute for hard-to-get imported tantalum—for corrosion resistance, for use in vacuum tubes, in low-voltage rectifiers, etc.

Concentrates Iron Ore—At Tuscaloosa, Ala., the bureau is working on concentration of iron ore to raise the iron content of the burden over the present average of 35 per cent, and thus increase pig iron production of southern blast furnaces.

The whole program is too comprehensive to cite in detail, but here are a few of the important projects:

Extraction of nickel from huge deposits of low-grade nickel-iron ores of Cuba, Washington and Oregon.

Concentration of the low-grade chromite of Montana, California and Oregon to get a grade suitable for electric smelting of ferrochromium.

Development of a hydro-metallurgical process for getting lead and zinc from so-called oxidized western ores which now largely are unused.

Utilizing the low vanadium content from phosphate rock of Idaho and Wyoming.

Development of an improved cadmium producing process to prevent present metallic losses. A similar campaign is aimed at saving present antimony losses.

Larger synthetic mica crystals are sought to eliminate the need for present large mica imports.

Seeks Substitutes — Continuing its search for substitutes for imported industrial diamonds, the bureau now is working on boron carbides, hardest of the carbides.

In the sillimanite of South Carolina and Georgia the bureau hopes to get an equivalent for Indian Kyanite, used in blast furnace roofs and other refractory installations.

To develop domestic material for grinding wheel production the bureau is seeking ways of improving low-grade domestic bauxite.

Search for lightweight concrete aggregates continues with the triple objective of getting stronger material, with better heat and sound insulation and requiring less steel for reinforcing purposes.

The bureau also continues, at College Park, Md., to wrestle with the difficult problem of utilizing aluminum scrap.

The bureau is working up broader specifications against which materials can be bought for the stockpile program. In addition, it has some secret assignments which Mr. Ralston cannot mention.

Plane Buying Plans Laid

ENGINEERING offices of the Department of the Air Force and the Navy's Bureau of Aeronautics in Washington will be mecca for hundreds of manufacturers of instruments, machinery, parts and gadgets now that these two defense arms have made up their procurement schedules for the first bite in the 70-group Air Force program.

Air Force will order 2201 planes, at an outlay of $1345 million, deliveries to start next year and to be completed in 1950. In addition, Air Force has $395 million for modernizing existing planes and retooling production lines, $108 million for procurement of guided missiles and electronics and communications equipment, and $250 million to pay for aircraft previously ordered. An additional $197 million is being retained by Air Force in case rising costs necessitate revaluation of the 2201 new planes.

Navy Bureau of Aeronautics will order 1165 planes at $653,635,000—and an additional $100 million is being retained for such revaluation as may be found necessary. BuAir also has $150 million to pay for aircraft previously ordered.

The Air Force procurement schedule, which will be carried out as fast as contracts can be negotiated (B denotes bombers, F fighters, C cargo

planes, SA search amphibian planes, T trainers) is:

Prospective contractor	Type of plane	Numbers of planes
Boeing	B50D	132
Boeing	B50C	30
North American	B45C	51
Northrup	B49	30
Republic	F84C	409
Lockheed	F80C	457
North American	F86A	333
North American	F86C	118
Curtiss	F87	58
Curtiss	F87A	30
Fairchild	C119B	99
Douglas	C124A	28
Grumman	SA16A	32
North American	T28	266
Lockheed	TF80	128

Navy BuAir schedule, also to be placed in operation as fast as contracts can be negotiated, (F denotes fighters, A attack planes, R and JR transport planes, P patrol planes, H helicopters) is:

Prospective contractor	Type of plane	Numbers of planes
McDonald	F2H	179
Grumman	F9F	317
Douglas	F3D	28
Chance-Vought	F6U	33
Chance-Vought	F7U	19
Douglas	AD	356
Grumman	AF	23
Martin	AM	47
Fairchild	R4Q	8
Grumman	JR2F	6
Undecided	under development	2
Lockheed	P2V	82
Sikorsky	HJS	19
Sikorsky	HO3S	18
Undisclosed	confidential	28

USAF Orders 266 Trainers

CHANGES which have taken place in pilot training since the recent war are pointed up by the Air Force announcement last week of placement of an order for 266 training planes with North American Aviation Inc., Los Angeles.

The two-place trainers have several important improvements over the North American T-6F, widely used during and since World War II. Maximum speed of the new plane is 292 mph against 205 for the T-6 and its ceiling is lifted to 31,650 ft, compared with 22,000 for the earlier type.

Engine Contract Let to Wright

CONTRACTS totaling more than $7 million have been placed by the Air Force with Wright Aeronautical Corp., the engine-building division of Curtiss-Wright Corp., for the production of engines for jet trainers and utility aircraft.

These are the first orders received by Wright under the Air Force's expansion toward 70-group strength.

Negotiations are being conducted on additional contracts with the company for production of Cyclone-18 engines, in addition to further orders for Cyclone 7 and 9 types, the company discloses.

Merchant Fleet Capacity Studied

CAPACITY of the nation's oceangoing fleet, subject to much current Washington scrutiny, now is much lower passengerwise and slightly higher cargowise than it was in the prewar era. Passenger and cargo capacities now are, of course, much lower than during the war.

On April 1, 1948, according to a survey by the National Industrial Conference Board, the passenger-carrying fleet consisted of 42 passenger and combination passenger and cargo vessels with a passenger capacity of 11,279 persons. On Dec. 7, 1941, the fleet consisted of 113 ships with a passenger capacity of 38,000.

Merchant Fleet — This country's merchant fleet on May 1, 1948, had about 1850 ships in active service. The fleet numbered nearly 6000 in wartime and about 1400 on Sept. 1, 1939. The active merchant fleet consists of 1117 privately owned and 724 government-owned ships on charter to private owners. There are 1500 vessels in the United States Maritime Commission reserve fleet. The remaining ships of the wartime merchant fleet have either been junked or are still under the control of the armed forces.

In 1946, the analysis notes, only 83 vessels were completed by American shipyards, with 39 in 1947 and 13 in the first four months of this year. In 1943, at the peak of war construction activity, 1661 vessels were produced.

Oil Fleet—International demand for oil has placed the privately owned American tanker fleet in a comparatively healthy condition. As of June 1, 1948, the fleet comprised 478 ships, compared with 352 American-owned tankers in 1939. Thirty-two out of 95 vessels, the analysis adds, aggregating 591,000 gross tons, on order on May 1 were tankers with a total gross tonnage of 502,000. Since that time at least 20 new tanker orders have been reported. Eight of these new tankers were ordered recently by Standard Oil Co. of New Jersey, bringing to $75 million the cost of a project which now calls for a total of 14 of the vessels, each with a capacity of 228,000 barrels or 70 per cent more than the T-2 tankers built during the war.

Six of the eight tankers will be built by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., and are expected to be completed by July, 1950. The two others will be constructed by the Sun Shipbuilding & Dry Dock Co., Chester, Pa., with completion dates in July and August, 1950. The six tankers previously ordered by Standard Oil were let to the same builders, four to Newport News and two to Sun.

Prospects for American shipyards have improved because of the tanker orders and because of the possibility of government action on a passenger liner program (STEEL, July 18, p. 68). There is also legislation pending in Congress aimed at strengthening the American merchant marine through amendment of the Merchant Marine Act of 1936.

ATOMS FOR INDUSTRY: Industrial as well as military interest in radio-active materials is evidenced by this shipment of selenium 75 to Ford Motor Co. Substance is stored underground for safekeeping, preparatory to being used in industrial research. NEA photo

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Commerce Department hopes special session of Congress will extend voluntary agreements program and broaden measure to permit fuller participation by industry advisers

DESPITE the atmosphere of political embroilment in which Congress will sit in the special session called by President Truman, many in Washington hope the session will bring action on some important matters left hanging in the air when the lawmakers adjourned to attend the Philadelphia political conventions.

For one thing, Congress can take the Commerce Department out of the dilemma in which it finds itself now that the administration has decided to rely on the voluntary agreements program to obtain steel for many important requirements.

First, Public Law 395, which provides the authority for voluntary allocations agreements, and gives antitrust law immunity to participating industries, needs extension beyond Feb. 28, 1949.

Second, Public Law 395 needs broader definition of authorization. For example, the Justice Department has not yet approved inclusion of Marshall Plan needs under the voluntary allocations setup.

Law Needs Amending — Third, the law must be amended to permit the Commerce Department to borrow more men from industry to man the Office of Industry Co-operation properly. Commerce asked Congress to insert a provision in P. L. 395 which would permit borrowing men from industry on a dollar-a-year or some similar basis, but early adjournment prevented action in June. More men will be needed from the steel industry, and two or three will be badly needed from the shipbuilding industry to handle allocations in connection with the coming naval and merchant marine shipbuilding program. **Still others will be needed from other industries to carry out future programs that appear in prospect.**

The fact that two steel men already loaned by the steel industry—Melvin W. Cole of Bethlehem and A. A. Wagner of Jones & Laughlin—never have been cleared by the Justice Department as bona fide government employees has proved embarrassing to the Commerce Department. These men are serving in a purely advisory capacity and cannot be called on to sign documents or exercise other authority. The government does not pay them a cent, not even traveling or living expenses. Commerce hesitates to cause additional embarrassment by inviting more men in from industry until situation is changed.

If it is not cleared up by Congress, the outlook is that industries called in for voluntary allocations agreements will have to deal with men not qualified by the proper training.

Have Same Trouble — Other government departments and agencies are having the same trouble right along and many of the appointments are truly amazing. The Economic Co-operation Administration, newest of the important agencies, is among those apparently not doing too well.

ECA needed, for example, two men to take care of special chores. One was to hold down Marshall Plan steel demands upon the United States, first by ascertaining to what extent the various countries can furnish steel to each other either out of surplus inventories or out of production, and second by assisting General Clay in his efforts to get increased steel production in Germany. The other was to take charge of the difficult chore of improving Greek transportation.

For the first assignment, ECA has named a New York banker, Samuel W. Anderson, and for the second a Chicago investment banker, John Nuveen Jr. Both are widely respected in their fields. But there are many in the capital who think it would have been better to assign a steel man to the first job and a railroad or construction man to the second.

LAST WORD: Simple stroke of the pen marks final settlement of huge war claims between U.S. and Britain which involved lend-lease accounts, reciprocal aid and surplus property. British Ambassador Sir Oliver Franks, right, signs the document as Secretary of State George C. Marshall looks on. NEA photo

ECA Has Cable Link With Europe

ALTHOUGH headquarters of the real Marshall Plan administration necessarily are at Paris, at the offices of CEEC (Committee on European Economic Co-operation), facilities just have been installed by the Economic Co-operation Administration in Washington by which it is in continuous cable communication with Paris and is informed of all new developments there . . . Incidentally, the new air conditioned structure in which the ECA is located in Washington has been christened the Andrew Jackson Building. However, the address that the ECA uses is 800 Connecticut Avenue N. W.

Hope for Trade Act Amendments

NEW TRADE Agreements Extension Act of 1948, it is hoped by some Washington business observers, will be amended when Congress next year

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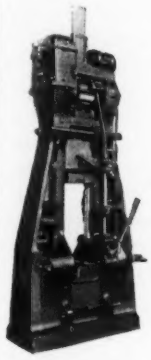
For 50 years the Chambersburg Engineering Company has specialized in building Forging Equipment. The high reputation which this company enjoys is an acknowledgment of the service built into its products.

Steam Drop Hammer

Steam Drop Hammers

The Model "E" Steam Drop Hammer embodies many exclusive Chambersburg features, such as the patented slide valve, differential cylinder porting, frame-to-anvil construction and many other features that result in more forging per blow, more blows per minute and accurate, close-limit forgings.



Board Drop Hammer

Board Drop Hammers

Made in belt drive or motor drive models. Modern design results in more accurate close-limit forgings, less down-time and lower maintenance costs.

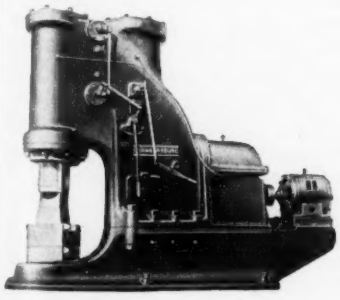
Ceco-Drops

The new CECO-DROP will outproduce any existing gravity drop hammer. Operates on steam or air. No boards, no belts, no motors. Performance records show *at least* 10% more forgings than on conventional gravity drop hammers, with simplicity, safety and low maintenance as additional features.

Ceco-Drop

Self-Contained Pneumatic Forging Hammers

Has a greater forging output than any other hammer of its type. Has heavier anvil, higher impact speeds, delivers more powerful blows and permits greater ease in control of blows. Can be installed anywhere regardless of steam or air supply. Operates from electric current with built-in air compressor.



Pneumatic Hammer

Single Frame Forging Hammers

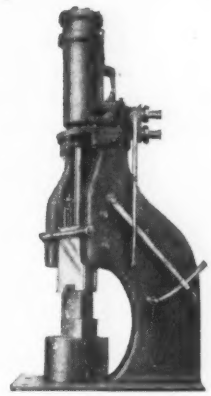
High Frame provides greater working space than any other single frame hammer. Can forge large discs, and rings, upset high stems, form arch bars, etc., most economically.

Double Frame Forging Hammers

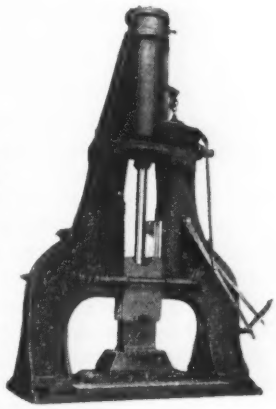
For the most exacting forging requirements. Greater forging capacity per blow, more work at higher temperatures, savings in power and operating costs. Provide positive, easy control.

Cecostamps

A high production, impact-type stamping machine for drop stamping light-weight, high strength, hard-to-form alloy sheet metal parts. Uses inexpensive, easily made dies of lead, zinc, Kirksite or similar metals. No matter how springy or resilient the sheet may be, a single blow from the CECO-STAMP results in a permanent set. Installed in many of the country's important sheet metal shops as well as in most of the aircraft manufacturing plants in the world.



Single High Frame Guided Ram Forging Hammer



Double Frame Guided Ram Forging Hammer

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Builders of **IMPACT** *Machinery*

gets around to extending the trade agreements program beyond June 30, 1949.

Designation of the Tariff Commission as the agency to advise the President on the "peril points" below which import tariffs should not be lowered may prove helpful, but the President is not bound to accept the Tariff Commission's findings.

Furthermore, while the Tariff Commission is the agency to which industry can complain about harmful competition in the form of imports, no agency was designated by Congress to consider complaints about foreign barriers against American goods.

While it is presumed the President will rely mainly on the State Department for advice on our export interests, he has not yet designated any agency for this duty.

The whole matter will be of importance shortly because a number of countries which are expected to sign up under the Geneva Pact (General Agreement on Tariffs & Trade) next month should be ready in the fall to undertake negotiation of bilateral agreements with the other signatory powers under the Geneva Pact. In particular, the new signators should include these countries which are enrolled or interested in the Marshall Plan: Iceland, Sweden, Italy, Turkey, Ireland, Denmark, Portugal, Greece and Switzerland.

Forrestal Alarmed by Rising Costs

ALARMED by the rapidity with which manufacturing costs of late have been mounting, Secretary of Defense Forrestal has asked the Departments of the Air Force and Navy to hold portions of their appropriations in reserve in case it is necessary later on to raise the value of contracts for new planes.

The Air Force now is about to place contracts for new planes at an aggregate price of $1,345,000,000, and for purposes of possible revaluation it is retaining $197 million free of any commitments.

The Navy is to order planes for $653,635,000 and retain uncommitted for revaluation purposes $100 million.

Sample of Government in Business

SOME objectors to proposed allocation of 59,000 tons of sheet steel for prefabricated housing maintain the chief beneficiary would be the Lustron Corp. One objector intimated the deal "smelled of favoritism" by the government to a government-financed corporation. Mysterious pressures were hinted behind the proposed allocation.

As brought out in hearings of the Senate Banking & Currency Committee when it was considering extension of the life of the Reconstruction Finance Corp., government financing of Lustron was done under the Veterans Emergency Housing Act of 1946, which authorized all sorts of inducements to get a big housing program going.

Devices Used—Under this act, Wilson R. Wyatt, who administered it as national housing expediter, used guaranteed market agreements, cash loans, subsidies and other devices to encourage house production.

The expediter, among other things, made arrangements with a number of prefabricated housing companies to build houses mainly of plywood but in some cases of steel. His biggest deal was with Lustron, and Expediter Wyatt got into a jam with RFC because of RFC's objection to the amount of money he wanted loaned to Lustron—$50 million.

Following White House intervention in the form of a letter from John R. Steelman, assistant to the President, RFC advanced $15,500,000 to Lustron. Since, on July 14, RFC advanced an additional $10 million. the government has invested $25,500,000—which is substantially Lustron's entire financing.

Striking Example—President Carl G. Strandlund and his associates in Lustron hold there is nothing in the story to their discredit. They showed initiative in grasping an opportunity created by Congress. However, the whole episode is another striking example of what happens when the government enters the field of business. Here is a company in which the government has invested $25,500,000 and which cannot operate without steel. Under the circumstances, therefore, particularly after the Steel Products Industry Advisory Committee gave its approval, even though reluctantly, to allocating sheets for prefabricated housing, it will not be to the government's interest to do anything that will prevent Lustron from producing housing.

Probably more will be heard about this later on, for the initial 59,000 tons is regarded as just a starter. Lustron alone plans to produce 50,000 steel houses a year, calling for 450,000 to 500,000 tons of sheets.

RFC's Loan Policy Outlined

HERE is the policy under which the Reconstruction Finance Corp. can make loans under the new law which spells out RFC's authority until 1954, plus two additional years for purposes of winding up its affairs—unless Congress acts later on to further lengthen RFC's life.

It can make loans to or purchase the obligations of any business enterprise operating under United States or state laws. Loans to railroads need ICC approval and loans to air carriers need CAB approval. No limit is set on individual loans but the total outstanding loans must not exceed $2 billion at any one time.

RFC can make loans to any financial institution and, with approval of the Secretary of the Treasury, to insurance companies. It can make loans on public projects such as toll bridges, stadia, water pollution projects, etc. It can make disaster loans.

It can participate in bank loans to not in excess of 70 per cent of $100,000 loans and not in excess of 60 per cent of loans over $100,000.

Loans to business can be made only, according to RFC interpretation, "when it is proved that the loans cannot be had from private sources at reasonable terms."

RFC may not make loans for longer than 10-year terms, excepting that loans on public projects may be repaid in 40 years.

Steel Supply Problem Unsolved

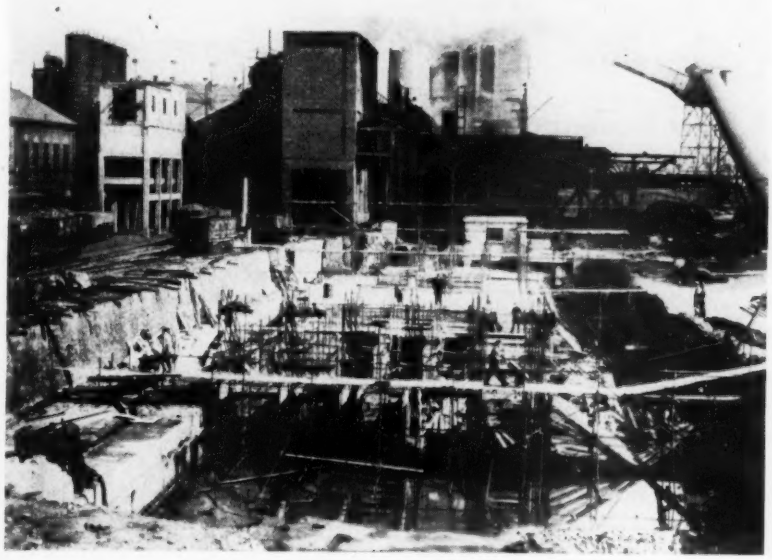
CALLERS at the Office of Industry Co-operation include small manufacturers who are interested in getting into some line of production for which they can get steel under allocations.

Several whose shops have plate bending equipment and welding facilities have inquired recently as to the possibility of getting plates for the production of large diameter pipe for pipelines.

In such cases the OIC is unable to give any help for the simple reason that steel plate could be provided to new outfits only at the expense of consumers already in production.

Alabama Adds to Ore Reserves

HEARTENING news for southern steel producers is contained in a report by the Bureau of Mines on investigation of red iron ore deposits in St. Clair and Etowah counties, Ala. Substantial reserves suitable for use in the blast furnaces of northeastern Alabama and of the Birmingham district were discovered. Approximately 2,121,000 tons of good-quality "hard" red ore are available in the Shinbone Ridge area and an estimated 4,780,000 tons of low-grade ore are available at the southwest end of the Greasy Cove deposit.



POTENTIAL PRODUCTION: Britain's hopes to get back in the running as a first rank steel producer are partly pinned on this plant under construction at Margam, near Port Talbot, Wales. The unit, to cost $240 million, will turn out 16,000 long tons of pig iron and 29,000 long tons of steel ingots a week. NEA photo

Ruhr's Problems Studied

American steel commission hopes to find means for increasing output

DUSSELDORF, GERMANY

CHANGE in the corporate organization of the German steel industry again appears to be in the making after a number of false starts and stops. An American steel commission arrived early this month and immediately settled down to a series of conferences aimed at solving the most troublesome problems confronting the industry.

This commission, which seems to be working with only slight formal connection with the British, is resolved to put the Ruhr on a sound industrial and financial footing, preparing the ground for new foreign investments through the Marshall Plan, the World Bank and other channels, and finding a means of stepping up steel production to the minimum level of six million tons a year.

Carrying on the work of the ill-fated group, consisting of Americans, Britons and Germans, which was dissolved rather than risk a fight over seating a German who was opposed to the socialistic concepts of many British and German trade unionists, the new commission has met with leading steel men from the Ruhr to learn at first hand their production and financial difficulties.

Deconcentrated Plants Pose Problem—Of extreme importance to German recovery is the degree of success the commission may achieve in untangling the problem of what to do with the newly formed independent steel companies. These semipublic nonintegrated firms are unable to operate at a profit. At present productivity is reduced to about one-third of its prewar level. It would now seem as though these companies must be returned to their former owners if the industry is to get into volume production again.

The British dismantling program is being hurried, seemingly as a last move before all dismantlings are stopped by top-level orders. In Dusseldorf the important tool works of Haniel & Lueg is being torn down at top speed, and equipment in other plants which never were included in the official dismantling lists is also being removed.

Machinery Firm Scrapped—Haniel & Lueg at Dusseldorf, a branch of Gute Hoffnungs Huette, has been a large factor in the manufacture of machine tool, crankshaft, oil well and coal mining equipment. Before the war it employed about 1600 men. Much of Europe and the Near East was dependent upon its products; following World War I, for example, the firm did all the exploration and well digging in the Iraq oil fields for the French; it helped build up the Baku fields in Russia and sank several coal shafts in the Kuznets oil fields; its most important business, however, was in the manufacture of cast iron rings, sunk into coal mine shafts to strengthen the walls; and of this product the company produced between 40 and 50 per cent of the Ruhr's requirements.

Beginning with a three-day visit of the British to the plant soon after the war, when they removed the company's crankshaft milling machine for shipment to the Glasgow shipbuilding firm of Somers, the plant has been in the process of dismantlement. This first removal was made even before the Potsdam agreement on dismantlings was formulated.

Forging Press Removed—In 1947 the removals began in earnest, first with an order for 13,000 tons of machinery. A modern heavy forging press went to Australia even though that country had no building to house the press and its permit to move the building was denied. Germans estimate it will take years before the press can be put into operation at Broken Hills Pty., Australia.

The Greeks were given the steel plant, consisting of three open hearths, one electric furnace, a large steel foundry, an annealing furnace, pumps and buildings.

To Pakistan went a 120-ton crane.

Yugoslavia received a press section, including the buildings, and other machinery, for which they admittedly had no use.

Other buildings and machinery went to Great Britain, the Netherlands, Belgium and Czechoslovakia. When machinery was not removed from the plant, in many cases the roofing was taken from the buildings leaving these machines exposed to the weather.

Plant Is Useless—At the end of March, 1948, an additional dismantling order was issued for 10,000 tons of machinery and structures. Great Britain got most of this tonnage, including tracks, transportation equipment, etc., which it took for the scrap value. Wiring went to Greece for scrap, and the piping, office fixtures, etc. were also taken out. In one small section of the facility which has been left almost intact, the crane rails were removed, thus rending the plant useless.

Why?—With everyone in Europe crying for Ruhr coal and the mines desperately in need of equipment, the question is asked "Why have these dismantlings been allowed to take place?" The company's management is convinced that foreign competition engineered the removals, and that danger of German rearmament had

nothing to do with it; this plant, as a matter of fact, made no war materiel.

The Marshall Plan, which provides for building a new power plant in the Cologne lignite fields, for example, and will entail opening new shafts, new pits, etc., is being jeopardized to some extent by this particular plant's dismantling.

Bizone Begins Aluminum Output

FIRST new aluminum to be produced in Bizonia came from the Toeging plant in Bavaria in April. This plant made 150 tons in that month as part of a 40,000-ton order distributed between it and the Juenen plant near Dortmund, the tonnage to be produced from wartime stocks of 270,000 tons of bauxite. The second smelter was to start operation in June.

During the initial operating period of both plants production is expected to be low, as equipment has lain idle and the labor shortage is acute. After the first difficulties are overcome, however, production from the two plants is expected to total from 15,000 to 20,000 tons by the first quarter of next year.

Record Set in British Steel

BIRMINGHAM, ENG.

BRITISH steel production reached the record annual rate of 15,444,000 tons in June. This compares with a rate of 15,220,000 tons in May and 13,206,000 tons in June, 1947.

Pig iron production in the same month was at the annual rate of 9,417,000 tons, compared with 9,552,000 tons in April and 7,502,000 tons a year earlier.

Even allowing for the usual drop in steel production during the holiday season, output is now running above the rate required to meet the revised target of 14.5 million tons. The continuing success of the scrap drive has meant that during the last three months there has been no decline in either scrap or pig iron stocks in spite of the high rate of consumption. Pig iron production throughout the summer months will probably be maintained at a high enough level to permit stocks to be increased.

Except for a hint here and there of hesitant buying in some industries, there is no real slackening in demand for steel. In fact the shortage of semifinished is acute and in the Midlands, if more is not forthcoming, it is likely that some rerolling mills will close temporarily. For many months these plants have been operating below capacity. One works producing machine-made chains has already shut down for want of mild steel wire.

Reds Claim Production Boosts

SOVIET industrial production in second quarter was 24 per cent higher than in the like period of 1947, according to an announcement by the State Planning Commission in Moscow. Target for overall production was exceeded by 6 per cent, the announcement said. Ferrous metals production was 11 per cent above its projected level.

By products, these gains over second quarter, 1947, were made, the Reds asserted: Steel 21 per cent; pig iron 18 per cent; rolled steel 23 per cent; copper 7 per cent; zinc 47 per cent; lead 10 per cent; coal 13 per cent; petroleum 15 per cent; gasoline 16 per cent; electricity 16 per cent.

New French Tramway in Use

AERIAL tramway nearly five miles long, to supply materials for the construction of the Chastang Dam at Argentat, France, was to begin operation July 1 after completion under direction of American Steel & Wire Co., U. S. Steel Corp. subsidiary.

The complete tramway, comprising more than 100,000 ft of wire rope and cable and 500 tons of structural steel, was designed and fabricated here and then shipped to France. Material will be hauled in 185 buckets riding on track cables supported by 40 steel structures from 15 ft to 86 ft high. Rise between the end terminals is 459 ft.

O. E. W. Dahlgren, construction engineer who has supervised the building of many of the 600 tramways designed by American Steel & Wire, is in charge of the project which has been built entirely by French labor.

World Water Power Jumps

TOTAL capacity of water-power plants of the world at the end of 1947—taken by many as a yardstick for noting industrial development—was 86,900,000 hp, as determined by the Geological Survey, Department of the Interior. This rise represents a 278 per cent gain over capacity of plants in 1920 which was about 23 million hp. The 1947 capacity compares with 77,800,000 hp in 1945 and 71,600,000 hp in 1941.

Nations which have shown the greatest increase in capacity since 1920 include the United States, Russia, Canada, France, Norway, Sweden, New Zealand and India.

Import-Export Gap Closing

Month-by-month trend is toward more imports, less exports. ECA trade progresses

THAT American trade with the rest of the world is a two-way street is brought home by the latest import-export statistics prepared by the Bureau of the Census, Commerce Department. Although traffic on the outbound-side of this street is about twice as heavy as in the other lane, the present trend is toward a decrease in what used to be called the "favorable" balance of trade and an increase in the "unfavorable."

United States imports for consumption increased in May to $543.6 million from $524.7 million in April. Since last December, imports have been well above the 1947 average of $478.3 million, having been over $600 million in two months and above $500 million in the others.

Exports in the latest month declined to $1091.8 million from $1112.6 million in April. Monthly average last year was $1204.7 million, a level which has not been reached since last October.

Marshall Plan Trade — Volume of trade under the Economic Cooperation Administration in May totaled $393.7 million in exports, and imports were valued at $78.7 million. The Marshall Plan participants in Europe received $344.1 million of this total and exported to the U. S. $65.3 million.

Since ECA began its operation up to June 26, procurement authorizations, including ocean freight charges, totaled $730.8 million, with European countries getting $700.2 million of this total and Trieste and China receiving the remainder. The European authorizations, divided into 21 products and transportation, bulked largest for foodstuffs in this first period of operations. Second, third and fourth places in value, however, went to petroleum products, coal and nonferrous metals, respectively. In twelfth and fourteenth places in this list were, respectively, iron and steel, and agricultural and industrial equipment.

New authorizations on June 26 totaled $122 million, distributed among France, Austria, Denmark, Norway, the Netherlands, the United Kingdom, Italy, Greece, Bizone Germany, and the French Zone of Germany. This amount is to cover purchases both from the United States and other countries of the following prod-

ucts: Freight cars, leather, nickel, copper, carbon black, graphite and carbon electrodes, fertilizer, petroleum products, cotton, chemicals and coal, as well as foodstuffs. Only authorization of steel was to Bizone Germany for procurement in Luxemburg of $3 million worth.

F.O.B. Means Higher Costs

West Coast steel users decry geographical disadvantage under new pricing system

STEEL consumers on the West Coast expect higher costs to be the most immediate result from the shift to f.o.b. pricing in the steel industry. With demand the way it is, many users in the area are not immediately alarmed, but in the long run they view pessimistically their chances to compete successfully with producers more geographically fortunate in regard to steel supply, as the Pacific region is still a steel-importing section.

As a group, steel fabricators on the Coast, particularly those using stainless, many types of pipe products and various varieties of alloys, expect to be hardest hit because they are dependent on eastern mills. For example, a western maker of hand tools obtains its hot-rolled alloy bar steel in Pennsylvania. It will now have to pay 22 cents more per hundred-weight. On the other hand, a firm fabricating and erecting buildings obtains its structural steel from Geneva, Utah, and its steel cost will be about the same under the new set-up.

May Benefit — Some fabricating industry officials believe the move, in the long run, will benefit the West Coast by causing an expansion in steel producing capacity in the West and extending the range of products now being produced in the area.

Confusion as to the practical applications of the new system persists, especially among construction firms and others who operate on a bidding basis. These companies point out that under current conditions where prices will vary from mill to mill and when there is no certainty as to where to obtain steel the bidding system becomes impractical.

Kaiser Co., which waited a week before announcing a change in its pricing system, has established mill pricing at its Fontana plant effective July 19.

ASM Congress To Feature Alloys

CENTRAL theme for the American Society for Metals' National Metal Congress and Exposition which meets in Philadelphia next Oct. 25-29 will be a salute to alloy steel in commemoration of the diamond jubilee in the history and development of these steels.

Featured at the congress will be a program of technical and historical papers about alloy steel and a "visualization" of the progress of alloy steels through engineering and research and the dependence of the American economy on alloys.

AIRCRAFT FOR ARGENTINA: Spurt in foreign orders for American-built transports is indicated by this 40-passenger, 300-mph Convair, one of five to be delivered to Flota Aerea Mercante Argentina this summer by Consolidated Vultee Aircraft Corp., San Diego, Calif. Firm also will build fleets for the Netherlands, Australia, India, Switzerland, Belgium and China

Triple Mill Shifts 1949 Meeting

AMERICAN Supply & Machinery Manufacturers' Association and affiliated distributor groups have shifted their 1949 Triple Mill meeting from West Palm Beach, Fla., to Cleveland which has more facilities to handle a convention of this size. To be held Apr. 25-27, the meeting again will feature the conference booth program.

Meetings . . .

July 26-27, Institute of Scrap Iron & Steel Inc.: Midyear meeting, Ambassador Hotel, Atlantic City, N. J. Institute executive vice president is E. C. Barringer, Dupont Circle Bldg., Washington.

Aug. 10-13, First Western Packaging Exposition and Conference: San Francisco Civic Auditorium, San Francisco.

Aug. 24-27, American Institute of Electrical Engineers: Pacific general meeting, Spokane, Wash. Institute headquarters are at 33 W. 39th St., New York.

Aug. 30-Sept. 3, American Chemical Society: Eastern section of annual meeting, Washington, D. C. Society headquarters are at 60 E. 42nd St., New York.

Sept. 6-10, American Chemical Society: Midwest section of annual meeting, St. Louis. Society headquarters are at 60 E. 42nd St., New York.

Sept. 7-20, Department of State: First inter-American conference on conservation of renewable natural resources, Denver.

Sept. 9-10, American Ceramic Society: Fall meeting, Hotel Conneaut, Conneaut Lake Park, Pa. Society headquarters are at 2525 N. High St., Columbus, O.

Sept. 13-17, American Chemical Society: Western section of annual meeting, Portland, Oreg. Society headquarters are at 60 E. 42nd St., New York.

Sept. 13-17, Instrument Society of America: Third instrument conference and exhibit, Convention Hall, Philadelphia. Society headquarters are at 1117 Wolfendale St., Pittsburgh.

Sept. 20-25, American Mining Congress: Metal mining convention and exposition, San Francisco. Congress headquarters are in the Ring Bldg., Washington.

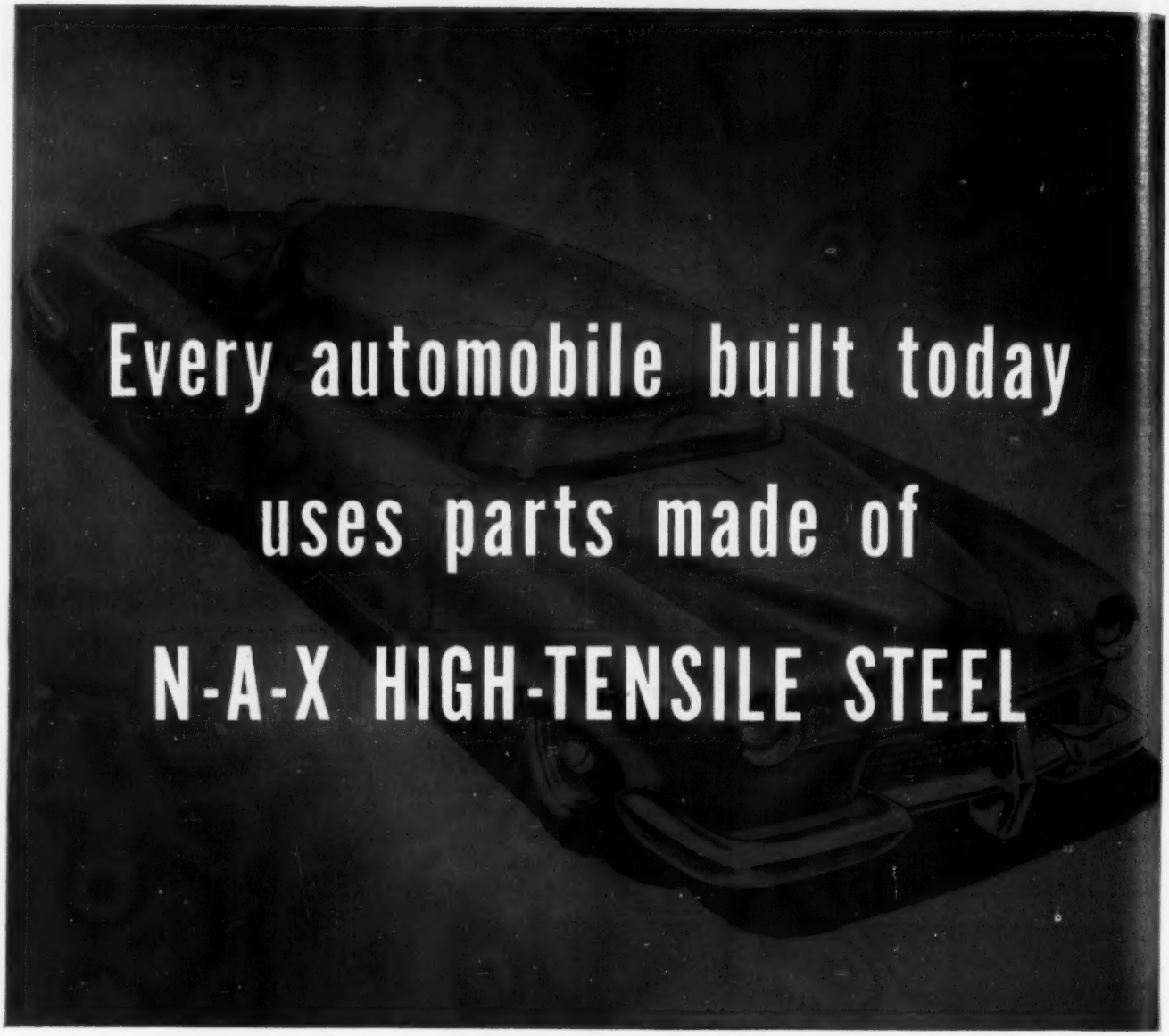
Sept. 23, American Iron & Steel Institute: Regional technical meeting, Hotel William Penn, Pittsburgh.

Sept. 23-25, National Association of Foremen: Twenty-fifth convention, Philadelphia. Association manager is J. E. Bathurst, 321 W. First St., Dayton, O.

Sept. 28-Oct. 1, Association of Iron & Steel Engineers: Annual convention, Public Auditorium, Cleveland. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Cleveland, Cleveland.

Oct. 4-11, American Institute of Steel Construction Inc.: Twenty-sixth annual convention, Chateau Frontenac, Quebec, Canada. Institute headquarters are at 101 Park Ave., New York.



Since 1940, when Great Lakes Steel pioneered the application of high-tensile, low-alloy steel to cold-stamped automobile bumpers, there has been a growing trend to N-A-X HIGH-TENSILE STEEL in the automobile industry.

Today, every car manufacturer is using the inherent better properties of N-A-X HIGH-TENSILE STEEL for some part of his automobile.

Bumpers and grilles – hoods and fenders–body panels and deck lids – frames and bracings – wheels and hub caps represent a few of many applications of N-A-X HIGH-TENSILE STEEL to the modern car.

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By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Tool and die shops grant 15-cent across the board wage increase and withdraw complaint of unfair labor practice against union. Production to be resumed

DETROIT

DOUBTLESS under considerable pressure from automobile and parts manufacturers for new tools and dies which have been in a state of suspended animation since June 17, managements of 77 Detroit-area tool shops raised their wage increase ante from 13 to 15 cents an hour, the figure their striking union locals were demanding, and began preparations for resuming operations on full scale this week.

Delayed die programs were reaching more serious proportions, and the tool and die shop operators can hardly be blamed for giving way as they see on almost every front the collapse of the remnants of resistance to an inflation which is getting a little out of hand. The increase, amounting to about 7 per cent on the average, will be passed on to customers who are already paying two to three times as much for new tooling as they did in 1939.

As a term of the wage settlement, the Tool & Die Manufacturers Association agreed to withdraw its complaint filed with the NLRB charging the union with unfair labor practice in negotiating individual settlements with a few companies on the 15-cent basis. Average hourly rate now will be close to $2.15. The increase was straight across-the-board, with skilled men receiving the same hike as the lowest-rate help.

New Model Work Goes Forward

THE Detroit tool shops were holding up a considerable volume of Chrysler work, despite the fact a large share of the Chrysler Division's body stamping program was placed in Philadelphia. The local portion, now being freed, will permit the entire project to move forward again and the timetable for year-end changeovers at Chrysler, Dodge, Plymouth and DeSoto looks feasible. Probability is that there will be a considerable sandwiching of the 1948 and 1949 schedules, with a start made on some elements of the latter well in advance of the last of the 1948 models. A six-weeks' lead time usually is the minimum needed for such parts as sheet metal and axles. Little is heard of any new engine designs for the 1949 Chrysler lines.

GM Plans 1949 Models

BUICK could get going within a month on its 1949 models and probably will be the first of the General Motors units to be rolling. Chevrolet and Pontiac will follow late in November, according to present outlook. Olds and Cadillac will come along shortly thereafter, although there is a chance Cadillac may spring its new rear fenders a little ahead of time. Olds is shaping up a V-8 high compression (around 8.5:1) engine for its 98 Futuramic series, but will not carry it on the two smaller models. Cadillac apparently will not venture into the high-compression field just yet. By the turn of the year, all GM divisions should be going on 1949 jobs and a public showing at the Waldorf-Astoria in January is in prospect, if reports of GM booking extensive space at this hostelry can be believed. Possibly the corporation is taking a leaf from the Ford book on this deal, after noting that the latter company staged one of the most successful showings ever recorded, at the Waldorf last month.

Automobile Production

Passenger Cars and Trucks—U. S. and Canda

	1948	1947
January	422,324	366,205
February	399,460	393,636
March	519,126	443,588
April	462,295	445,137
May	359,987	404,191
June	460,615*	421,466
6 mos.	2,623,807	2,474,223
July		400,944
August		364,478
September		444,501
October		461,536
November		417,493
December		492,109
12 mos.		5,055,284

* Preliminary.

Estimates for week ended:

	1948	1947
July 3	112,307	63,460
July 10	98,700	90,075
July 17	118,999	103,091
July 24	120,000	83,867

Estimates by Ward's Automotive Reports

Nash To Close for Changeover

NASH has confirmed earlier reports in this department of an August shutdown for extensive plant changes incident to completely new models which should be on the assembly line just after Labor Day. Integral-type frame will be used on both the 600 and Ambassador series and the latter will be distinguished from the former more definitely in 1949 by the use of a somewhat larger and different front end design. Both are slated to be wider and lower, with more room for passengers and luggage, plus many mechanical improvements and innovations. Brakes and clutch on the 600 model have been overdue for redesign and enlargement.

The Wisconsin producer has achieved a rousing production run since the resumption of production following the war and there has been no important change in production tools, many of which are near the limit of their useful life. Meanwhile, designs for the first really new postwar model were moved along at leisurely pace and have been ready for production for some months. Preliminary work has started on installation of new plant equipment—foundations for heavy presses, rerouted conveyor-lines and the like. Although the announced shutdown for changeover is of better than a month's duration, many of the 12,000 employed at Milwaukee and Kenosha, Wis., plants will remain on the job to refit production lines and to get pilot output under way on components. Assemblies this month have been running around 3400 weekly and should draw to a close this Friday.

Suppliers Struck

CAR and truck production has climbed practically to a new postwar peak at 120,000 per week but little jubilation is heard over the accomplishment. Three strikes at plants of important suppliers cloud the immediate outlook and make reductions in schedules almost inevitable. A month-old walkout at Campbell, Wyant & Cannon Foundry Co.

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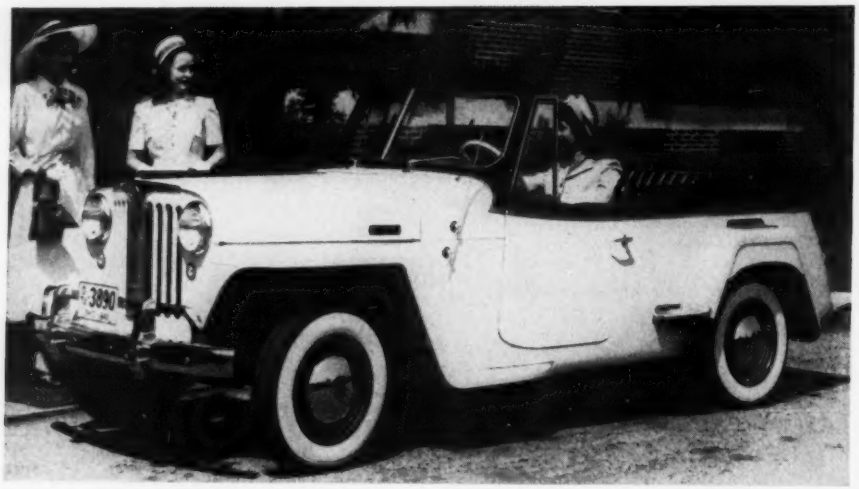


Willys-Overland's new sports phaeton, the Jeepster, is a descendant of its forbear, the Jeep. Designed as a "sun car built for fun," the sports model is one of the first full-sized light cars to reach the market. Weighing only 2500 pounds, it offers fuel economy up to 29 miles per gallon of gas, has independent front-wheel suspension, soft rear springing, and excellent roadability because of its low center of gravity. Continental styling is finished in two colors, brilliant yellow with contrasting black trim, or fire wagon red. Reported price: $1765, f.o.b. Toledo, O.

in Muskegon has dealt a crippling blow to shipments of gray iron castings for Hudson, Lincoln, Chrysler, Ford trucks and tractors. Fair backlogs have permitted operations to proceed and castings slated for replacement parts have been diverted to production lines. These are at best expedients and the string has just about been run out. Another critical interruption has occurred at Timken-Detroit Axle Co. where the UAW-CIO turned down a wage increase since it was not accompanied by a boost in piecework rates. Rear axle shipments to truck builders have been cut off and inventories are being rapidly depleted. The third labor ruction is at Monroe Auto Equipment Co., supplier of shock absorbers and sway bars to several leading manufacturers. Alternate sources have come to bat in some instances but they cannot continue to fill the breach for any long period.

Meet the Jeepster

LATEST addition to the line of utility vehicles developed from the basic Jeep design is the Jeepster or sports phaeton model introduced last week by Willys-Overland. It has been in limited production for a few months and was shown to visitors at the last institutional day celebration at the Toledo plant. With wheelbase of 104 in. and overall length of 178½ in., it is built on the same frame as the Jeep station wagon, although an x-member is added for additional rigidity required in an open car. Changes have been made in the suspension system to give a softer ride. Front unit is a single transverse Dow semi-elliptic spring, rear units are 50-inch leaf springs parallel with the frame. Shock absorbers are airplane-type, direct-acting hydraulic, interposed between the outer end of the spring (in front) and the upper suspension arm. Rear axle is semifloating, with Hotchkiss drive.

Power plant is the regular 4-cylinder Jeep engine, developing 63 horsepower at 4000 rpm. Overdrive is standard equipment, giving a top speed in excess of 70 and a claimed fuel economy of 29 mpg at 35 mph. Gross weight of the car is 2500 lb.

Styling is definitely continental in flavor, with the door line curved and slightly lower than the rest of the body.

The Jeepster is definitely aimed at a young group of buyers and in fact was designed from suggestions received during the war from overseas soldiers on how to make the Jeep a "hot" passenger car. Willys hopes to build 15,000 of them by the end of the year, and initial production will come through in only two colors—fire-engine red and canary yellow. It will be the only true sports car built in the United States, if convertibles are eliminated from this classification, and marks another step by Willys in perfecting vehicles which have no competitors in the ranks of the big three.

Willys Profits Improve

POLICY of the Toledo producer in hewing to the Jeep line and staying away from battles with other manufacturers in the passenger car field is paying off in profits. Net earnings for the nine-month period ended June 30 were nearly $5¼ million, an increase of 124 per cent over the corresponding period a year ago, and equal to $1.75 per share on common stock. During the third quarter of the fiscal year, earnings exceeded $2 million, 73 per cent over a year ago, despite the fact vehicle production, at 36,916, was only 18 per cent numerically over the same period the year previous. The company, incidentally, has deposited $6.5 million with the Internal Revenue Collector against excess profits taxes withheld and income tax deficiencies for the fiscal years ended Sept. 30, 1941, 1942 and 1943, plus interest on these amounts. Reserves had been set aside for this purpose, as well as to cover federal income tax deficiencies for the fiscal years 1944, 1945 and 1946, which have not yet been determined by the government.

The Willys assembly plant at Maywood, Calif., will assume function of distributor for the state effective Oct. 1. The company is one of the few left operating under distributor-dealer setups, having 100 domestic distributors and 2400 dealers. Most other companies have disbanded distributor organizations in favor of direct shipment arrangements with their dealers.

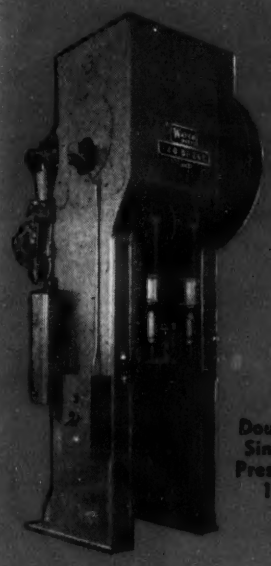
Douglas Starts New Division

THE AUTOMOTIVE industry, particularly those elements now having or planning assembly operations on the West Coast, are eyeing with interest the organization of a metal products division by Douglas Aircraft Co. at Santa Monica, under direction of Harry Woodhead, former Republic Steel executive and later top man at Consolidated-Vultee Aircraft. Purpose of the division would be to furnish pressed metal components, including automotive stampings, to West Coast manufacturers. Combination of a leading aircraft manufacturer with the known talents of Mr. Woodhead in the steel fabricating field is regarded as an auspicious one.

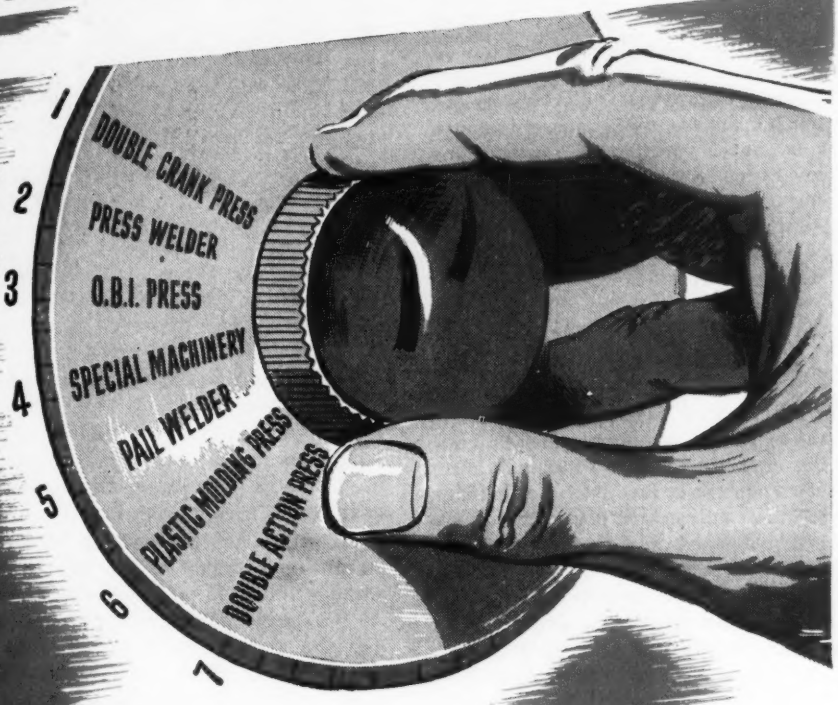
Correction

EQUIPMENT for Hudson Motor Co.'s sheet mill at Newcastle, Pa., the Valley Mfg. Co. which now is in production, was purchased from the Frank B. Foster Co. Inc., Pittsburgh, not the L. B. Foster Co. as stated in these columns previously in the issue of July 19.

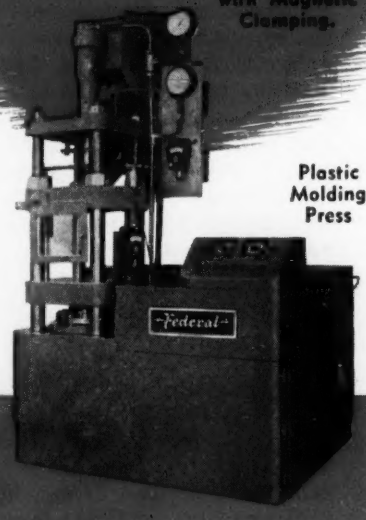
A Safe Combination



Double Action Single Crank Press. Capacity 120 tons.



Federal 350 KVA 84" Sheet Flash Welder with Magnetic Clamping.



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Paint in a Quonset Plant

Arco erects permanent Quonsets in 18 weeks for lacquer department hit by fire

ARCO Co., Cleveland, manufacturer of industrial finishes, has housed its lacquer department in five permanent Quonset-type buildings just 18 weeks after the original lacquer building was destroyed by fire.

Included in the $200,000 layout are 22 explosion-proof mixing tanks, special spark-proof concrete floors, floor level ventilation, self-closing covers on mixing tanks, automatic sprinkler system, fire-resistant insulation and flash-arresting vents to prevent flash-back fires on solvent storage and blending tanks. The five Quonsets are also spread out to minimize operational hazards.

Main Unit—Main unit in the plant is a structure equipped with mezzanine charging platforms and mixing tanks having an aggregate processing capacity of 22,000 gallons. Four other Quonsets are used for blending lacquer thinners, storing nitrocellulose, housing pumping equipment and cleaning portable tanks and other equipment. The new plant adjoins a brick building which contains the lacquer production testing laboratory and facilities for storing pigments and other materials.

Rapid completion of the plant, according to Howard E. Wise, Arco president, was made possible by the co-operation of equipment manufacturers and some of their customers who waived prior claims on certain equipment.

ARCO RESUMES LACQUER PRODUCTION IN RECORD TIME AT A NEW QUONSET PLANT

Expansion Set at $4.6 Billion

AMERICAN business, exclusive of agriculture, expects to spend about $4.6 billion during the third quarter of 1948 for construction of new plants and the purchase of new equipment. In addition, business will spend another $100 million on old or used plants and equipment.

Anticipated third quarter expenditures, according to the Securities & Exchange Commission and the Department of Commerce, are about on a level with outlays which business expected for the second quarter, and are above the actual first quarter outlays largely because of seasonal factors. The rates of aggregate expenditures anticipated in the second and third quarters of 1948 exceed those in the corresponding 1947 period, although most of the increase results from inflation. According to reports earlier this year, total 1948 expenditures for new plants and equipment were expected to reach $18.6 billion. This figure still appears accurate.

Expenditures planned by manufacturing companies for the third quarter of 1948 account for about 40 per cent of the total for all industry and are estimated at about $1.9 billion. This would be a slight drop from that estimated to have been spent in the second quarter.

Gray Iron Forms Chicago Group

MANAGEMENT Executives Group of Gray Iron Founders' Society has been formed in Chicago, the twenty-first such unit to be organized.

R. L. Collier, society executive vice president, addressed the new group and described how the society functioned under such an organizational setup to help relieve a pig iron famine in New England brought about by the blowing out of the Mystic blast furnace in Boston.

Chairman of the newly organized management group is Edward B. Sherwin, president, Chicago Hardware Foundry Co. Vice chairman is R. H. Lehmpuhl, secretary, Sheffield Foundry Co., and secretary-treasurer is Robert F. Grover, Love Brothers Inc., Aurora, Ill.

No Wash Day Blues

WASHING machine and ironer manufacturers have spent more than $10 million since the war on new plants and additions to old ones, with some of the largest projects yet to be completed.

The industry's capacity is easily three or four times that of prewar years, it was reported at a closing session of a summer meeting of American Washer & Ironer Manufacturers' Association at Mackinac Island, Mich. Roy A. Bradt, president of the association, cautioned however, against over-confidence.

Kearney & Trecker Buys Tool Firm

KEARNEY & Trecker Corp., Milwaukee, builder of machine tools for milling and boring, has purchased Walker-Turner Co. Inc., Plainfield, N. J., manufacturer of light machine tools for industrial and home workshop uses.

The Walker-Turner plant, which will continue its operations as the Walker-Turner division of Kearney & Trecker, employs about 400 persons. All facilities will remain in Plainfield and general supervision will be continued under present management. Established in 1922, the company for the first 15 years confined its activities to the manufacture of light wood-working tools for home workshops. Since 1937 emphasis has been more upon machine tools for industrial shops for work on both metal and wood.

$5 Million Ship Contract Let

CONTRACT to build several ships for Flota Mercanta Grand Colombiana has been awarded the Montreal firm of Canadian Vickers Ltd. Value of the vessels is set at $5 million. Keels for two cargo liners, of 9000 tons each, will be laid at once.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Crosley Division, Cincinnati, Avco Mfg. Corp., has appointed Frank Corp., Savannah, Ga., as its distributor for Crosley home appliances in parts of Georgia and South Carolina.

—o—

Automatic Transportation Co., Chicago, manufacturer of materials handling equipment, has named J. M. Barclay Inc., Newark, N. J., newly organized, as its sales representative in New Jersey north of Trenton.

—o—

Youngstown Sheet & Tube Co., Youngstown, has moved its Columbus, O., district office from 2600 to 2850 LeVeque Lincoln Tower. Sam Cole is manager.

—o—

Verson Allsteel Press Co., Chicago, has placed in operation in the Cleveland plant of Oliver Corp. a specially designed 2000-ton press to be used in the fabrication of many of the big parts for the Oliver 20-ton Cletracs employed in logging, roadbuilding and large farming operations.

—o—

Materials Handling Institute, Pittsburgh, announces the formation of a Toledo, O., chapter representing 20 industries in that area. President of the chapter is E. H. Marek, Willys-Overland Motors Inc.

—o—

Tennessee Coal, Iron & Railroad Co., Birmingham, U. S. Steel Corp. subsidiary, recently presented service medals to 115 employees in recognition of long employment.

—o—

Continental Gage Corp. expects to occupy a plant at Franklinville, Md., where it also has three acres available for expansion. Recently formed, the firm plans to manufacture mechanical and electrical instruments and controls. Lewis L. Corcoran is president.

—o—

Bound Brook Oil-less Bearing Co., Bound Brook, N. J., manufacturer of oil-retaining bearings, bushings and washers, has appointed Eynon-Dakin Co., Detroit, as a sales representative. Moore Kelly will continue as Bound Brook's special representative at 1255 Book Bldg., Detroit.

—o—

Cleveland Tapping Machine Co., Hartville, O., manufacturer of tapping machines and accessory jigs, fixtures and feed devices, has appointed Fletcher F. Milligan Co., Cleveland, as its northern Ohio sales representative, and E. G. Gauspohl & Associates, Cincinnati, as its agent for southwestern Ohio, southern Indiana and Kentucky. Breen & Ahlers Sales Co., Dayton, O., is sub-agent in the territory adjacent to Dayton and Columbus.

—o—

American Cladmetals Co., Carnegie, Pa., announces that its main product, stainless clad copper, will be known as Rosslyn Metal. Previously stainless clad copper was called Amclad.

—o—

Putnam Tool Co., Detroit, manufacturer of end mills and other cutting tools, is again in production after suffering $300,000 damages in June from a mid-air collision and subsequent crash of a Navy fighter plane into its plant.

—o—

General Electric Co., Schenectady, N. Y., announces that direct sales and service facilities for arc welders, electrodes and welding accessories are now available to industry at its Fitchburg, Mass., plant.

—o—

Wyman-Gordon Co., Worcester, Mass., has purchased from RFC for $1,146,244 the facility which adjoins its Harvey, Ill., plant. Unit was operated during the war by its Ingalls-Shepard Division for the manufacture of aircraft parts. Unit will now be used to make drop forgings and automobile crankshafts.

—o—

Avondale Marine Ways Inc., Westwego, La., recently completed a power barge for Creole Petroleum Corp., subsidiary of Esso Standard Oil Co. Unit will be used for drilling off-shore oil wells in Lake Maricaibo, Venezuela.

—o—

Four Wheel Drive Auto Co., Clintonville, Wis., manufacturer of four wheel drive motor trucks, recently held its second annual postwar sales meeting, attended by over 100 sales representatives from the United States, Canada and several foreign countries.

—o—

United States Testing Co. Inc., Hoboken, N. J., announces that Commander Finn Ronne, Antarctic explorer, has joined its scientific staff to formulate plans for establishing the first climatological research laboratory in America.

—o—

War Assets Administration has announced plans to complete disposal of all personal property inventories by the end of 1948, preparatory to going out of business by Feb. 28, 1949.

—o—

General Tire & Rubber Co., Akron, has purchased a controlling interest in Marquardt Aircraft Co., Azusa, Cal., manufacturer of ramjet aircraft engines. General Tire will expand the Marquardt plant.

—o—

Koppers Co. Inc., Pittsburgh, has named Kasle Steel Corp., Detroit, as its warehouse distributor in Michigan for Plastipitch, a weatherproofed sheet steel.

—o—

Turco Products Inc., Los Angeles, manufacturer of industrial cleaning compounds, will build a plant at McCook, Ill., to supplement manufacturing facilities at Chicago, Los Angeles and Houston.

—o—

Owen Bucket Co., Cleveland, manufacturer of clamshell buckets and industrial grapples, recently held an employee service banquet. Among those honored were 14 employees with 20 or more years' service.

—o—

General Electric Co., Schenectady, N. Y., reports it is making propulsion turbines and gears for more than one-third of the 30 large oil tankers now under construction or under contract in this country.

—o—

Meehanite Metal Corp., New Rochelle, N. Y., announces that a contract has been negotiated with Goulds Mechanisation Ltd., Newport, Monmouth country, Wales, to produce Meehanite castings.

—o—

Chesapeake & Ohio Railway, Cleveland, plans a $9 million expansion project at its Russell, Ky., coal yards.

—o—

Air Reduction Sales Co., New York, subsidiary of Air Reduction Co., has added soapstones to its line of welding supplies.

—o—

Associated Manufacturers of Southern California plans to maintain a permanent Los Angeles exhibit of metal, plastic and wood products. Membership drive now under way is aimed at enrolling manufacturers with fewer than 100 employees or a sales volume of $500,000 or less.

—o—

Rheem Mfg. Co., San Francisco, manufacturer of steel containers, water heaters and other appliances, anticipates 1948 earnings to exceed $60 million. Firm was founded in 1923 with first year sales of $15,000.

The Business Trend

RECOVERY which industrial production made between the week ended July 10, which contained the Fourth of July holiday, and the week ended July 17, during which time the captive coal mine strike was settled, was the sharpest since the week following New Year's Day. STEEL's index of industrial activity gained 16 points to register 169 per cent (preliminary) of the 1936-1939 weekly average.

STEEL—Operating rate in the basic steel industry had pushed up to 90.5 per cent of capacity in the week ended July 17, and indications are that with settlement of the coal strike and grant of wage increases to the nation's steelworkers ingot production over the remainder of the year will exceed the first half's by approximately two million tons, bringing the year's total to upwards of 88 million tons. How this output will be apportioned among the country's steel consumers is a question, however. New allocations for military purposes and other essential industries will cut into the available supply.

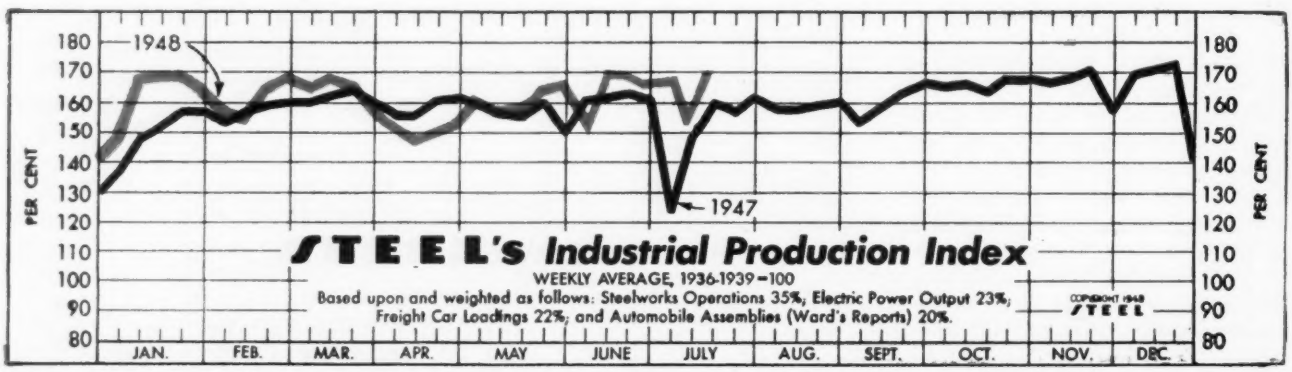
AUTOS—Suppliers' strikes notwithstanding, U. S. autobuilders turned out the second largest number of cars and trucks this year in the week ended July 17. Their output was 113,869 units, which, combined with Canadian operations, brought the latest week's total to 118,999. Drastic cutbacks in production are threatened, however, if strikes in component suppliers' plants, now in progress, are prolonged.

CAPITAL INVESTMENT—Third quarter expenditure by American business, exclusive of agriculture, for new plant and new equipment will be about $4.6 billion, on the basis of a survey by the Securities & Exchange Commission and the Department of Commerce. Of this total, manufacturing companies are expected to account for 40 per cent. Contrary to the rest of business, however, which plans expenditures on a par with the second quarter level, manufacturing and transportation (other than railroads) probably will spend less on plants and equipment than in second quarter. Railroads, and electric and gas utilities, on the other hand, anticipate an acceleration in their spending rate.

TRUCKLOADINGS—Volume of freight carried in motor trucks in May, although 2.1 per cent under the April figure, was 11.3 per cent greater than in May, 1947, American Trucking Associations Inc. reports. Carriers transported an aggregate of 2,742,206 tons.

PRICES—Advancing 0.1 per cent above the previous week, average wholesale prices pushed to a new postwar high in the week ended July 10. Bureau of Labor Statistics index moved to 166.8 per cent of the 1926 average, and was 1.2 per cent over a month ago and 12.5 per cent above a year ago.

INFLATION—Potential source of heavy inflationary buying is seen by the Federal Reserve Board in the present large holdings of liquid assets by American consumers. These assets, which include government bonds, savings and checking accounts, had increased by $12 billion in the last two years to bring their total at the end of 1947 to $130 billion.



Index (chart above): Week ended July 17 (preliminary) 169 Previous Week 153 Month Ago 169 Year Ago 160

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	90.5	89.0	96.0	92.5
Electric Power Distributed (million kilowatt hours)	5,197	4,760	5,159	4,732
Bituminous Coal Production (daily av.—1000 tons)	1,678	578	2,217	1,023
Petroleum Production (daily av.—1000 bbl.)	5,444	5,480	5,492	5,050
Construction Volume (ENR—Unit $1,000,000)	$126.6	$168.7	$126.9	$104.4
Automobile and Truck Output (Ward's—number units)	118,999	98,700	109,259	103,091

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

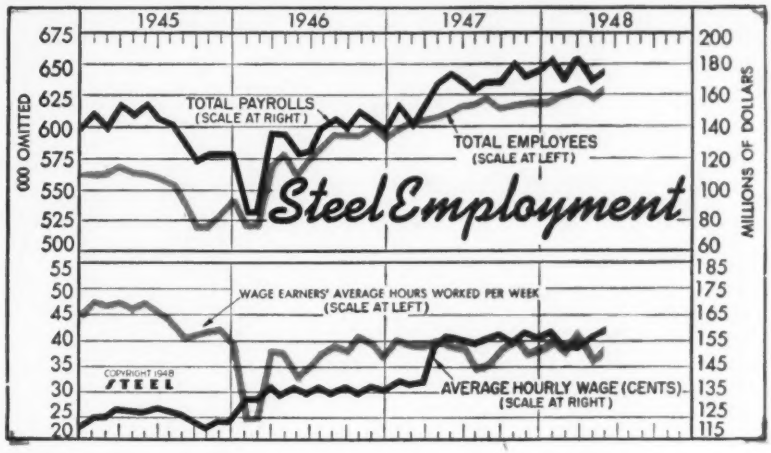
TRADE				
Freight Carloadings (unit—1000 cars)	910†	756	907	920
Business Failures (Dun & Bradstreet, number)	91	88	100	63
Money in Circulation (in millions of dollars)‡	$27,959	$28,142	$27,808	$28,225
Department Store Sales (changes from like wk. a yr. ago)‡	−4%	+28%	+1%	+8%

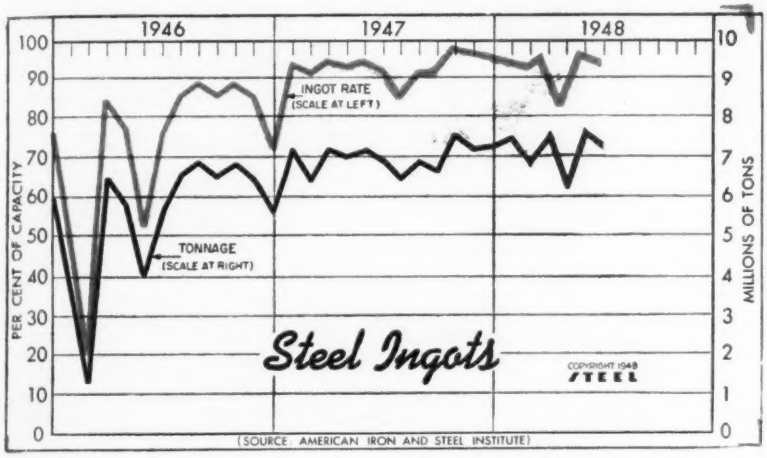
† Preliminary. ‡ Federal Reserve Board.

Steel Employment

	Employees† (000)		Total Payrolls (millions)		Hourly Wages† (cents)	
	1948	1947	1948	1947	1948	1947
Jan.	622	601	$180.2	$155.8	157.3	138.1
Feb.	626	607	167.6	139.5	155.1	137.0
Mar.	629	609	183.0	150.6	154.8	137.9
April	626	611	168.5	168.3	155.1	153.3
May	628	615	175.3	175.8	157.7	155.6
June	....	623	....	167.6	....	154.7
July	....	623	....	163.2	....	153.9
Aug.	....	625	....	169.1	....	155.6
Sept.	....	618	....	168.9	....	157.1
Oct.	....	620	....	180.1	....	154.6
Nov.	....	624	....	171.0	....	158.7
Dec.	....	621	....	175.3	....	156.5

† Monthly average.





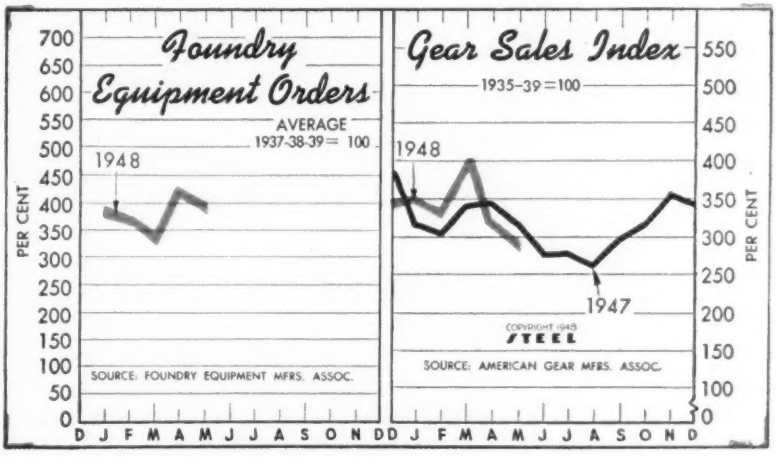
Steel Ingots

	Production (Net Tons—000)			Operating Rate (% of Capacity)		
	1948	1947	1946	1948	1947	1946
Jan.	7,473	7,213	3,873	93.6	93.0	49.6
Feb.	6,940	6,422	1,393	93.0	91.7	19.8
Mar.	7,608	7,307	6,509	95.3	94.3	83.3
Apr.	6,218	7,043	5,861	80.4	93.8	77.5
May	7,560	7,329	4,073	94.7	94.5	52.2
June	7,256	6,969	5,626	93.8	92.8	74.4
July	....	6,570	6,619	...	84.9	84.9
Aug.	....	6,982	6,924	...	90.1	88.7
Sept.	....	6,789	6,556	...	90.6	86.9
Oct.	....	7,560	6,952	...	97.5	89.0
Nov.	....	7,233	6,458	...	96.3	85.4
Dec.	....	7,366	5,760	...	95.2	73.9
Total		84,784	66,603	Ave.	92.9	72.5

Foundry Equipment Orders* and Gear Sales

	Foundry Equipment Orders*—Index (1937-38-39=100)	Gear Sales—Index (1935-39=100)	
	1948	1948	1947
January	380.9	346.8	317.0
February	367.3	324.4	303.0
March	326.2	389.8	342.9
April	412.0	320.9	346.2
May	388.5	283.6	317.2
June	....	....	278.0
July	....	....	278.5
August	....	....	261.6
September	....	....	297.7
October	....	....	317.7
November	....	....	356.9
December	....	....	343.6

* By foundry trades only.


Foundry Equipment Orders
AVERAGE 1937-38-39=100
1948
PER CENT
SOURCE: FOUNDRY EQUIPMENT MFRS. ASSOC.
Gear Sales Index
1935-39=100
1948
1947
COPYRIGHT 1948 STEEL
SOURCE: AMERICAN GEAR MFRS. ASSOC.
D J F M A M J J A S O N D D J F M A M J J A S O N D

FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$14,081	$12,258	$14,248	$12,605
Federal Gross Debt (billions)	$252.9	$251.9	$251.5	$258.5
Bond Volume, NYSE (millions)	$19.1	$15.1	$25.2	$26.7
Stocks Sales, NYSE (thousands)	7,211	4,232	7,727	5,939
Loans and Investments (billions)†	$62.6	$62.6	$63.4	$63.2
United States Gov't. Obligations Held (millions)†	$34,431	$34,666	$35,667	$39,099

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$80.27	$80.27	$80.27	$69.82
All Commodities†	166.8	166.7	164.9	148.3
Industrial Raw Materials†	184.2	184.3	181.6	162.0
Manufactured Products†	161.1	160.9	159.3	143.7

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

GEORGE W. SMITH JR.

GEORGE H. DEIKE JR.

SAMUEL S. JOHNSTON

George W. Smith Jr. has been elected president, De Laval Steam Turbine Co., Trenton, N. J., succeeding **H. L. Watson,** who has retired after 35 years of service. Mr. Watson will continue to be part of the company's management in the capacities of a director and chairman of the executive committee. Before becoming associated with De Laval in 1947 as assistant to the president, Mr. Smith served successively as vice president and director of White Motor Co.; as works manager and a member of the executive committee of Victor Talking Machine Co., which is now Victor Division of RCA; as manager of two divisions of Bendix Aviation Corp.; as a director of Ohio Crank Shaft Co.; and as chief engineer, Naval Aircraft plant at the Philadelphia Navy Yard. More recently Mr. Smith has been engaged in industrial engineering consulting services as the senior member of the New York firm of Smith & Wood Inc.

—o—

Blaw-Knox Co., Pittsburgh, announces the appointment of **Robert W. Frank** as president and general manager of its Lewis Foundry & Machine Division, succeeding **F. E. Walling,** who has resigned to assume duties with a company not connected with the steel industry. Prior to his present appointment, Mr. Frank had been assistant general manager of the Lewis Foundry & Machine Division for the past three years, and was formerly superintendent of blooming and billet mills at the Duquesne plant of Carnegie-Illinois Steel Corp.

—o—

Tinnerman Products Inc., Cleveland, announces appointment of **Robert D. Williams** as personnel manager. He began his career with Chase Brass & Copper Co., where he was recently assistant personnel director.

—o—

George H. Deike Jr. has been appointed secretary of Mine Safety Appliances Co., Pittsburgh, and **C. P. Rooney,** appointed as assistant treasurer. In addition to his new position, Mr. Deike will continue to be chief engineer of the company, a post he has held since 1941. Mr. Rooney will retain his position of assistant secretary.

—o—

Harry W. Beedle, manager of the Boston branch for the past 13 years for Electric Storage Battery Co., Philadelphia, has retired after more than 38 years' service. **Herbert H. Warren** has been appointed assistant manager of the company's New York branch. **Thomas G. Tynan,** assistant branch manager at Boston, has been named to succeed Mr. Beedle there as manager.

—o—

Link-Belt Co., Chicago, announces the appointment of **Crozier S. Wileman** as district sales manager at Wilkes-Barre, Pa., to succeed **A. C. Williams,** retired after 43 years of service. Mr. Wileman has been associated with the company since 1924, serving in engineering and sales capacities. He will be assisted by **Alton H. Ziegler,** recently transferred from the Philadelphia district sales office.

—o—

Allen L. Chaplin has been appointed project engineer at the Natrium, W. Va., plant operated by Columbia Chemical Division, Pittsburgh Plate Glass Co. Mr. Chaplin was formerly associated with General Precision Equipment Co. as assistant to the director of engineering, Askonia Regulator Division, and with American Cyanamid Co., in charge of process control, Engineering Division.

—o—

Samuel S. Johnston, technical director of electrolytic department, Weirton Steel Co., Weirton, W. Va., has been elected president, American Electroplaters' Society. Active in the society for a number of years, Mr. Johnston has previously held the positions of first and second vice president. Other elections announced are: **Arthur W. Logozzo,** president, Nutmeg Chrome Corp., Hartford, Conn., named first vice president; **William J. Neill,** general superintendent, Columbus Metal Products Co., Columbus, O., second vice president; and **C. F. Nixon,** director of process engineering, Fisher Body—Ternstedt Division, General Motors Corp., third vice president of the society.

—o—

E. B. Newill, general manager, Allison Division, General Motors Corp., New York, has been elected a vice president of the corporation, which he joined in 1929. Mr. Newill's headquarters are at Indianapolis, where he became associated with the Allison Division in 1943 following various executive positions within the corporation.

—o—

Westinghouse Electric Corp. has announced that **Leon R. Ludwig,** manager of the Buffalo Divisions of the company, has been named general manager of these divisions, and **Willard D. Ligon,** works manager, has been promoted to manager of the Motor Division in Buffalo. Other executive changes at Buffalo are: **Theo-**

MAKING THE BIG CHIPS FLY!

Sunoco Emulsifying Cutting Oil Is Used for Rough-Finishing of Heavy SAE 3140 Forgings

The correct cutting fluid is a big factor in the continuous heavy-duty machining of tough steel forgings on the machine shown above.

Machine: Warner & Swasey 4-A Heavy-Duty Turret Lathe

Material: SAE 3140 Forging

Operation: Roughing-Out Cap for Pile-Driving Machine

Cutting Fluid: 1 part Sunoco Emulsifying Cutting Oil to 20 parts water

Sunoco Emulsifying Cutting Oil is a viscous, self-emulsifying oil that quickly and easily forms a stable emulsion with water. It contains no animal or vegetable fats, and will not turn rancid.

Sunoco Emulsifying Cutting Oil meets the demand not only of tough cutting jobs, but also of a wide range of turning, milling and grinding operations calling for close tolerances and fine finishes. It is particularly efficient where precision machining at high cutting speeds is demanded.

For full information, for samples to test on your own machines, for the services of a cutting oil specialist, call your nearest Sun office. Or write Department S-7.

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SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY

SUNOCO

dore C. Fockler, assistant works manager, promoted to assistant general manager; **Charles E. Albright,** superintendent of production, Motor Division, appointed director of production for the Buffalo Divisions, and **William G. Miller,** assistant to the works manager, named manager of manufacturing, Motor Division.

—o—

C. Lee Cook Mfg. Co., Louisville, manufacturer of piston rings and packings, announces the appointment of **Marion A. Boulden** to its sales engineering staff. Mr. Boulden has served for a number of years as a power engineer with the DuPont interests. He eventually will make his headquarters at Charleston, W. Va.

—o—

Ernest Kuehn, Pacific Coast regional manager of Electro-Motive Division, General Motors Corp., with headquarters at San Francisco, has retired, and **Corliss A. Bercaw** has been appointed to succeed him. **George W. Rukgaber** has been appointed district sales manager in the Chicago region to succeed Mr. Bercaw. Mr. Kuehn will remain available as a consultant until Jan. 1, 1949. He had been associated with Electro-Motive for 25 years, having joined the company shortly after it was founded as manufacturing manager, remaining with the organization when it was purchased by General Motors in 1930.

—o—

Fred J. Menninger, formerly plant superintendent at Newark, N. J., for Federated Metals, division of American Smelting & Refining Co., has been promoted to the position of assistant plant manager at Newark. He will be succeeded as superintendent by **Earl R. Marble Jr.,** who has been serving as assistant to the manager of technical operations for all Federated plants.

—o—

William H. Shank has been appointed advertising manager, Hardinge Co. Inc., York, Pa. He succeeds **R. C. Ferguson,** who has been named north central district manager for the company. Mr. Shank had previously been a staff member of W. H. Long Co., York advertising agency.

—o—

Dr. Wendell F. Hess, head of metallurgical engineering at Rensselaer Polytechnic Institute, Troy, N. Y., has been made an honorary member of the American Welding Society.

—o—

L. A. Lambing has been appointed assistant general superintendent, Pittsburgh Works, Jones & Laughlin Steel Corp. He formerly had been superintendent of the open hearth and bessemer department. **D. R. Loughrey,** formerly assistant superintendent, bessemer department, has been named superintendent, open hearth and bessemer department.

—o—

A. M. Fleming, for the past 11 years works manager of the Chrysler Division, Chrysler Corp., Detroit, has been appointed vice president in charge of manufacturing. He has been with Chrysler since 1924. **Fred A. Wunderlich,** also active with the company since its organization, has been named general works manager, succeeding Mr. Fleming.

—o—

Charles H. Caldwell has been appointed sundries sales promotion manager, B. F. Goodrich Co., Akron. He has been handling sales promotion for the company's shoe products for the last 18 months, and will continue in that capacity in addition to his new duties.

—o—

C. A. Hanson, vice president, James Mfg. Co., Ft. Atkinson, Wis., has been elected president, Barn Equipment Association, succeeding **R. W. Louden,** who served two terms. **Wilbur Higgins Jr.,** Starline Inc., Harvard, Ill., is the new vice president, and **R. C. Hudson,** president, H. D. Hudson Mfg. Co., Chicago, was reelected treasurer.

—o—

Crocker-Wheeler Electric Mfg. Co., Ampere, N. J., division of Joshua Hendy Corp., has announced the appointment of **Ralph S. Drummond** as manager of the Cincinnati Crocker-Wheeler branch office. Mr. Drummond has been sales manager of Dynamotor Corp.

—o—

Frank A. Learman, former director of sales, and for the last eight months San Diego division manager, Consolidated Vultee Aircraft Corp., San Diego, Calif., has resigned from the corporation which he joined in 1939. **Frank Harrison,** former vice president, Curtiss-Wright Corp., has been named to assist **Lamotte T. Cohu,** president of the company, in production management at the San Diego division.

—o—

Alexander W. Wundheiler, supervisor of ordnance research in the U. S. Navy Department bureau of ordnance, has been named research professor of mechanics at Illinois Institute of Technology, effective Sept. 1.

—o—

Harry C. Goodale Jr. has been appointed middle western sales representative for American Swiss File & Tool Co., Elizabeth, N. J. He will make his headquarters at Detroit. He was formerly sales manager, Lord-Taber Co. Inc., Canandaigua, N. Y.

—o—

Iron & Steel Products Inc., Chicago, announces the election of the following officers: **John F. Parker,** president and treasurer; **W. J. Parker,** executive vice president and secretary; and **Charles A. Marshall,** vice president and general manager.

—o—

William Brunkala has been added to the technical staff at Milwaukee, Stearns Magnetic Mfg. Co.

—o—

Max Bradshaw has been appointed by Allis-Chalmers Mfg. Co., Milwaukee, as district manager for Ohio, West Virginia and western Pennsylvania. He joined the company in 1942 as materials expediter, and after the war, was transferred to the Tractor Division's civil engineering department, where he undertook testing and job study of Allis-Chalmer's equipment in the field.

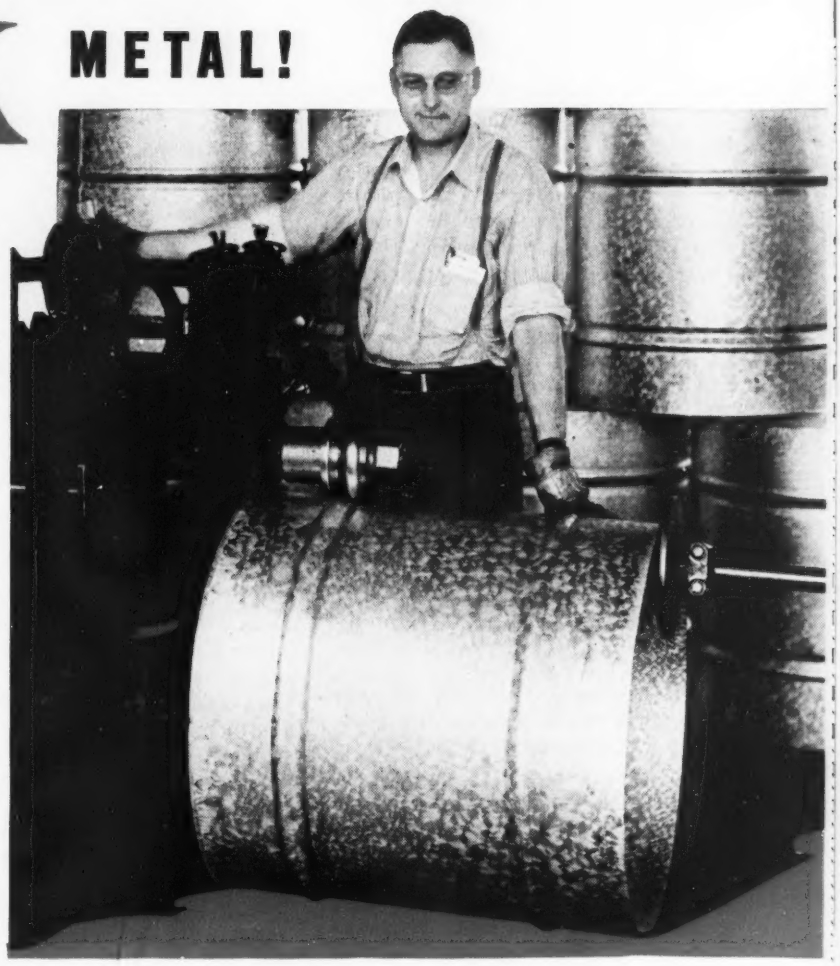
—o—

George R. Throop Jr. has been appointed Chicago district manager of

RALPH S. DRUMMOND

MAX BRADSHAW

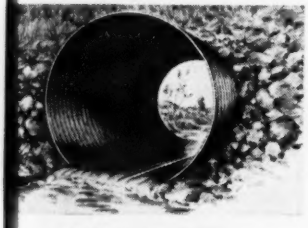
BUILD PREMIUM PRODUCTS WITH KONIK METAL!



Today's customers look for the best products their money can buy. That's why more and more manufacturers are using Continental KONIK. They know that whatever they make of steel will provide longer, better service if it is made of KONIK metal.

KONIK, an open hearth alloy steel containing closely controlled proportions of copper, nickel and chromium, has greater strength and toughness . . . it provides extra resistance to rust and corrosion.

Commercial use of KONIK will open up new economies for those who use steel sheets. It withstands greater abuse in fabricating, causing fewer rejections. It solders and welds readily . . its uniform zinc coating withstands difficult forming operations. Continental KONIK metal helps make better products . . . helps build sound repeat business. Call your jobber, or write Continental.

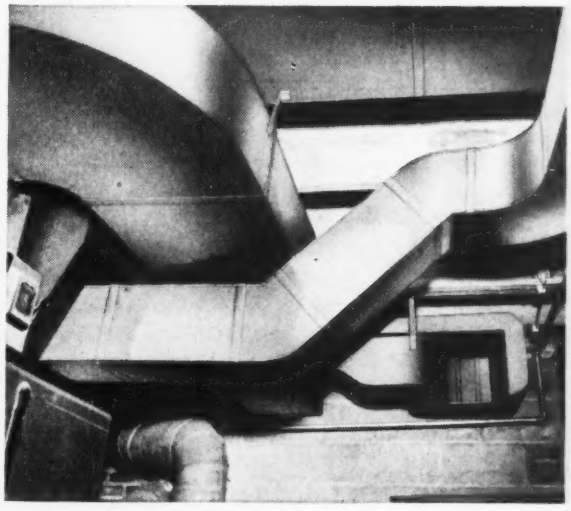


CULVERT PIPE

CHAIN LINK FENCE

USE KONIK METAL WHEREVER RESISTANCE TO RUST IS IMPORTANT!

● Continental KONIK has been proved under the most rugged conditions. It has proved its value over many years for culvert pipe in use under difficult and varying conditions. Continental Chain Link, the only fence made of KONIK, has provided property protection for industry, institutions and residences the country over. If your installations, inside or outside, call for galvanized sheets, you can depend on extra durability from KONIK metal.



CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF STEEL SHEETS, including Continental GALVANIZED, COPPER-STEEL Galvanized, KONIK steel sheets Galvanized, UNIFORM SPANGLE Galvanized, DULL COAT, Continental GALVANNEALED, ELECTRICAL, Hot Rolled Pickled, and many styles of Formed Roofing. ALSO, Manufacturer's Wire in many sizes, shapes, tempers, and finishes, Continental Chain Link Fence, Nails, and other steel products.

American Zinc Sales Co., distributor of American Zinc, Lead & Smelting Co.'s products. He will assume his duties Aug. 1.

—o—

Ampco Metal Inc., Milwaukee, announces the appointment of **Floyd H. Boyer** as its sales representative for Colorado, and Laramie county, Wyoming. He will handle the sale of all Ampco products with the exception of arc and resistance welding electrodes and centrifugal pumps.

—o—

Clifford V. Coons has been appointed vice president in charge of sales, and **G. M. Greenwood,** vice president and treasurer of Rheem Mfg. Co., San Francisco. Mr. Coons joined the company in 1934 at the Richmond, Calif., plant. He was manager of the Houston, Tex., plant, and later went to New York as manager of containers sales. Since 1945 he has been general manager of sales. Mr. Coons will continue his headquarters in New York. Mr. Greenwood joined the Rheem company in 1941 as treasurer, and was made a member of the board of directors later that year. He will continue to be located in the company's San Francisco offices.

—o—

Paul F. Steketee Jr. has been elected president, Keeler Brass Co., Grand Rapids, Mich., succeeding **Isaac S. Keeler,** who has been named chairman of the board. **I. E. Stegmier,** general superintendent of manufacturing operations, has been named to succeed Mr. Steketee as vice president.

—o—

Henry J. Zimmerman, general traffic manager, B. F. Goodrich Co., Akron, since 1921, has been named assistant to the vice president, and assigned to special administrative duties. **Richard W. Corns** has been named to succeed Mr. Zimmerman as general traffic manager.

—o—

Hartwell A. Greene has been made assistant comptroller, Tennessee Coal, Iron & Railroad Co., Birmingham. He joined T.C.I. in 1943 as supervisor of the Tax Division of the comptroller's department.

—o—

G. W. Warner, for the last 32 years chief inspector for Allis-Chalmers Mfg. Co., Milwaukee, has retired after 50 years of service.

—o—

Norman R. Irvine has been named to represent the Pressed Steel Tank Co., Milwaukee, in several southern states. He returns to that organization after five years spent with the U. S. Army. He joined Pressed Steel Tank Co. in 1929, and later served as purchasing agent.

HARRY WOODHEAD

—o—

Harry Woodhead, recently president, Consolidated-Vultee Aircraft Corp., San Diego., Calif., has joined Douglas Aircraft Co. Inc., Santa Monica, Calif., as general manager of its new Metal Products Division. This division has been established for the manufacture of a wide variety of pressed metal products, following expansion of Douglas Aircraft into industrial manufacturing fields not related to the aircraft industry. **A. W. Larsen,** formerly purchasing director, Consolidated Vultee, has been named assistant to Mr. Woodhead. Prior to his association with the aviation industry in 1940, Mr. Woodhead held various posts, including association with Cleveland Metal Products Co., Parish & Bingham Co., as vice president of Midland Steel Products Co., general works manager, A. O. Smith Co., and as vice president, Truscon Steel Co., which later became a subsidiary of Republic Steel Corp. in 1937. Mr. Woodhead also held the post of vice president, Federal Pressed Steel Co., Milwaukee, and president, Aviation Mfg. Corp. and American Central Mfg. Corp.

—o—

William D. Taylor, associated with Lukens Steel Co., Coatesville, Pa., as an engineer since 1936, most recently serving as assistant metallurgical engineer, has been named superintendent of the inspection department of Lukens and its divisions, By-Products Steel Co. and Lukenweld. This department is now a separate and distinct one, having formerly been a part of the metallurgical department.

—o—

Announcement of the following promotions has been made by the Electro-Motive Division at LaGrange, Ill., General Motors Corp.: **Milton Gardner,** formerly regional service manager at St. Louis, has been made district sales manager; **L. M. Williams,** sales representative, St. Louis, named manager of the branch warehouse and service repair shop at Emeryville, Calif.; **J. E. O'Leary,** formerly assistant regional service manager, has been made regional service manager, St. Louis region. Other appointments in the St. Louis region include: **G. C. Smith,** assistant regional service manager; **Guthrie Hill,** district engineer; **E. A. Tucker,** service engineer, and **Rene Pommier,** regional parts representative. **O. W. Anglemier** has been appointed service engineer, with headquarters at Louisville.

—o—

Walter W. Moore, formerly superintendent, Burnside Steel Foundry Co., Chicago, has been appointed works manager.

—o—

D. F. Brawn has been appointed sales manager, Stamping Division, Eaton Mfg. Co., Cleveland. He started with the company in 1922 and worked in the purchasing, production and sales departments in Cleveland until 1933, when he went to Detroit to handle sales for the Stamping Division.

—o—

George W. Nielsen is the newly elected chairman of the Birmingham section, Association of Iron and Steel Engineers. **J. Walter Johnson** is vice chairman, and **Merrill C. Booth,** district secretary.

—o—

George R. Brockway has been appointed sales manager, Rapids-Standard Co. Inc., materials handling equipment manufacturer of Grand Rapids, Mich. He joined the company in 1943 and was assistant sales manager and central regional sales manager. **Richard R. Williams** has been appointed direct sales representative for the Toledo, O., territory.

—o—

Frederick G. Rodenburgh, New York sales manager, Pennsylvania Salt Mfg. Co., has retired after nearly 50 years of service with the company. Effective last week, the New York sales office has been consolidated with the Paterson, N. J., sales office, and **Charles A. McCloskey,** Paterson district sales manager, will be in charge of the new office, which will handle Pennsalt sales in eastern New York state, including metropolitan New York area; the New England states, and northern New Jersey.

—o—

O. W. Franke has been promoted from general works manager to operating manager of the Dodge Division of Chrysler Corp., Detroit, and **M. C. Patterson,** from plant engi-

FRANK R. DeBARTOLO

EDGAR P. HULSE

ELLISON L. WEFEL

neer to general works manager. Mr. Franke has been with Chrysler and its predecessor company, Maxwell, since 1921. Mr. Patterson became associated with Dodge in 1920.

—o—

B. A. Best has been elected a member of the board of directors of Dearborn Motors Corp., Detroit. Secretary-treasurer and controller of the corporation, he fills the vacancy resulting from the death of **Albert J. Browning,** vice president of the Ford Motor Co.

—o—

Earl C. Ward, former vice president and controller, and a director of Montgomery Ward & Co., Chicago, has been named general manager of the newly created parts and accessories division of Ford Motor Co., Dearborn, Mich.

—o—

Paul H. Startzman has been appointed general manager in charge of operations at Oliver Iron & Steel Corp., Pittsburgh. He is resigning from partnership in the firm of Drake, Startzman, Sheahan, Barclay Inc., New York engineering specialists in materials handling and allied industrial operations.

—o—

Frank R. DeBartolo, formerly chief engineer, Lombard Corp., Youngstown, was recently appointed assistant to the vice president, in charge of all promotional and development activities. Previously employed as plant engineer for the ordnance plant, United Engineering & Foundry Co., Youngstown, he later was chief engineering draftsman for the Design Division, U. S. Naval Gun Factory, Navy Yard, Washington. **Ellison L. Wefel,** associated with Oilgear Co., Milwaukee, from 1937 until this year as a special hydraulic engineer, has been named chief engineer of Lombard Corp. **Edgar P. Hulse** was recently appointed assistant chief engineer. He had been associated with C. H. Hunt Inc., Pittsburgh.

—o—

H. H. Robertson Co., Pittsburgh, announces the appointment of **A. C. Hopkins** as assistant traffic manager. He was formerly with the Pennsylvania Railroad and the Alcoa Steamship Line.

—o—

Alwin F. Franz has been elected a director of Colorado Fuel & Iron Corp., Denver. Since Nov., 1946, he has held the position of vice president in charge of operations for the corporation and subsidiary companies.

—o—

William H. Noble has been appointed assistant district sales manager, San Francisco, for Republic Steel Corp.

OBITUARIES . . .

Dr. Rolland C. Allen, 67, executive vice president and director, Oglebay Norton & Co., Cleveland, and nationally known geologist and mining engineer, died July 18 after a long illness. Dr. Allen also was executive vice president and a director of Atwater Dock Co., Brule Smokeless Coal Co., Saginaw Dock & Terminal Co. and the Toledo, Lorain & Fairport Dock Co., and was a director in various other companies. He was president and trustee of Battelle Memorial Institute, Columbus, O.

—o—

Russell W. Metzner, 50, sales manager at Schenectady, N. Y., for the Tube Division, General Electric Co., died July 17 after a short illness.

—o—

Louis E. Emerman, 56, chairman, Emerman Machinery Corp., Chicago, and owner and chairman, Unit Crane & Shovel Corp., Milwaukee, died July 10 in Chicago. He had been in the used machine tool business in Chicago since 1922. In 1941, Mr. Emerman leased machinery to Great Britain for $1 a year per machine.

—o—

Harry H. Coombe, 92, chairman of the board of directors, William Powell Co., Cincinnati, since 1941, died recently. He became affiliated with the company in 1904 and served as its president from 1926 to 1941, when that office was assumed by his son, Harry E. Coombe.

—o—

Armour W. Barbour, 59, chief engineer, Jones & Laughlin Steel Service Inc., Long Island City, N. Y., died July 18.

—o—

Harry Brearley, 72, British metallurgist, and discoverer of stainless steel, died July 14 in England. He had written many books on the subject of steel analysis and steel making. Mr. Brearley visited the United States in 1921 and lectured at the Massachusetts Institute of Technology. He was awarded the Bessemer Medal.

—o—

William N. Cromwell, 94, attorney who took a leading part in the organization of United States Steel Corp., died at his home in New York July 19. He also was president-founder and director of the American Braille Press of New York and Paris.

—o—

B. G. Thele, 49, chief engineer for the coal mines of Tennessee Coal, Iron & Railroad Co., Birmingham, died July 17.

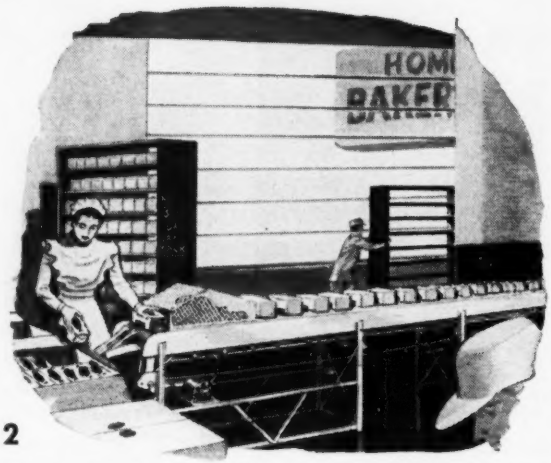
—o—

Theodore Jacobson, 64, former factory manager and consultant engineer, SKF Industries Inc., died July 15 at his home in Philadelphia after a prolonged illness.

Maybe you can wrap up a profit, too

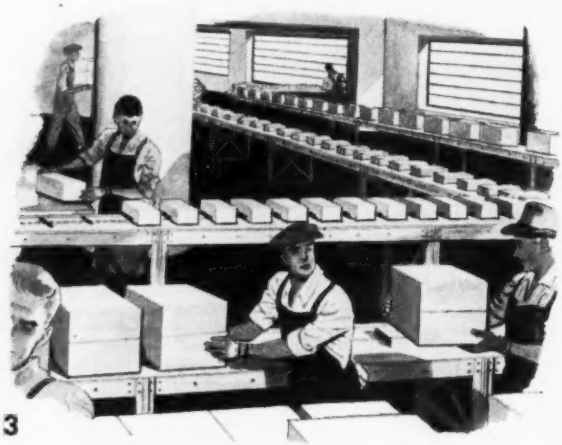
1

Trouble? That's right! Bakeries couldn't wrap cakes and cookies fast enough. Hand wrapping shot cost kite-high. What to do? What bakers did led to drastic changes that can affect your business, too. Cake wrapping called for an intricate use of motion. Packaging-machine designers faced a tough task. Many attempts at solution failed. Then . . .



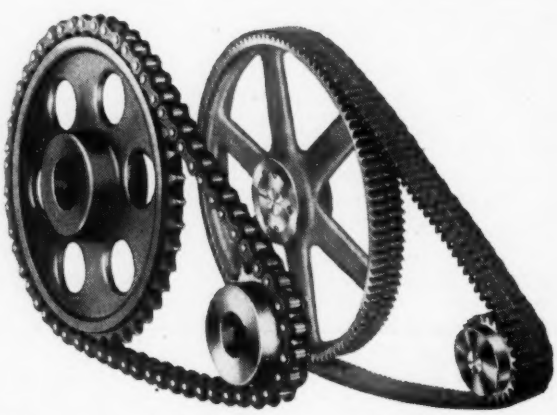
2

Morse Engineers tackled the toughie! Previous experience dictated the use of Morse Roller Chains and Sprockets. These did the trick! Had the application called for Silent Chains, Morse Engineers would have recommended them. Morse Roller Chain on wrapping machines helped increase bakery efficiency and profits. Now, how about *your* business? . . .



3

It's entirely possible to step-up the speed and efficiency of many of your machines, your production line, and even your consumer products with Morse Roller and Silent Chain and Sprockets. *Wherever there is industry* the application of Morse units have saved money, time and trouble. For complete information covering uses, dimensions, prices, installation and ordering data . . .



4

Roller Chain Silent Chain

Write for Roller Chain and Sprocket Catalog; and new, complete Silent Chain and Sprocket Catalog C 71-48.

Address Dept. 175, Morse Chain Co., 7601 Central Ave., Detroit 8, Michigan.

Morflex Couplings

Roller Chain Couplings

Friction Clutches

MORSE

MECHANICAL
POWER TRANSMISSION
PRODUCTS

A PRODUCT OF B-W BORG-WARNER

Free Wheeling Clutches

MORSE CHAIN COMPANY • DETROIT 8, MICHIGAN

Engineering News . . . AT A GLANCE

"ZINC CHILLS"—When working with zinc or zinc-coated or zinc containing metals, a worker may be affected by the fumes. So-called "zinc chills" also are sometimes experienced in brass foundries and similar enterprises. Acording to J. I. Banash, consulting engineer, International Acetylene Association, Chicago, such an illness is not considered a serious disease. It is self-limiting, but usually the individual affected is back on the job the next morning. Although various remedies and preventatives have been proposed, it still boils down to the fact that some persons are more susceptible than others. The cure is to transfer the man to another task.

NO HYDROGEN EMBRITTLEMENT—To make full use of the wearability of the chrome it uses to face its piston rings, Wilkening Mfg. Co., Philadelphia, recently developed a new metal for the ring. It is a special alloy, centrifugally cast, then heat treated to produce a dense, uniform structure which is tough and resilient, with very high tensile strength. The new metal is said to be safe from breakage even under very heavy loads because it is not subject to hydrogen-embrittlement.

PROVIDES A CENTURY OF SERVICE—Latest sheet metal developed for roofing purposes by metallurgists of International Nickel Co. Inc., Huntington, W. Va., is estimated to last approximately 100 years. It possesses all mechanical and corrosion resistant properties of roofing sheet previously produced except that it is softer in temper and lends itself more easily to various bending, forming, seaming and soldering operations. The metal already is being used for skylight framework, penthouse sidings, throughwall flashings, gutters, cornices etc., as well as complete roofs. It remains unaffected by sudden temperature changes which normally affect most metallic roofing materials.

PALLETIZED INGOTS—To help foundrymen reduce overall costs, Nassau Smelting & Refining Co. Inc., Tottenville, Staten Island, N. Y., recently established the practice of shipping ingots on pallets to customers so desiring without extra cost. The pallets measure 22 x 40 inches, and are loaded with 96 ingots weighing about 2300 pounds. The latter are strapped firmly to the pallets to facilitate stacking. According to Nassau, one foundry reports that it formerly required 62 man-hours to unload and stack a 50-ton carload of loose ingots, whereas, the same quantity recently received on pallets required only 1½ man-hours for a fork-lift truck operator to do the entire job.

SEEKS GIANT METAL PRESS—In Washington, United States Air Force technicians are investigating practicability of building a huge 60,000-ton hydraulic forging press for processing aircraft parts. Use of such a press, it was pointed out, would result in conservation of man-hours, material and costs. Production of an A-26 wing spar cap, for example, requires an extensive array of expensive machinery, small army of workers, considerable time and 275 parts, when using ordinary methods. The cost per cap runs about $267. Under an advanced production method — "splitting" — developed by Douglas Aircraft, cost is reduced to $167. However, by using the forging method, it is believed cost can be cut to $85 per cap.

"GEARED" FOR SAFETY — Mechanized wheel fabricating procedures followed in the plant of Norris Stamping & Mfg. Co., Los Angeles, in turning out auto wheels not only keep handling to a minimum, but also include safety precautions. After the trimming operation on the rims, for instance, units are clamped in position on a flash welder, then welded and ejected from the machine automatically onto a conveyor. Although the rims are hand-loaded in the welder, stops and aligning pins automatically locate the edges to be welded. (p.66)

UNIFORM PLATING—To obtain a uniform plating thickness on steel stock used for venetian blinds, Life Time Products Corp., Los Angeles, employs a tension and control system capable of controlling the speed of the strip from 24 to 96 feet per minute. The material, as it is pulled off the mill coil, goes through a precleaning solution, a rinse tank and over a series of five plating cells which deposit the zinc electrolytically on one side of the strip. The latter then moves back and is carried through another series of five cells to put the same amount of plating on the opposite side of the strip, before it passes through a wash tank, a phosphate and hot chromic acid tank to fix the phosphate coating on the stock. The steel is then recoiled for slitting and is ready for baked enamel finishing. (p. 69)

ACTS AS DIE LUBRICANT—Whether a strippable plastic coating can be used to advantage in any particular metalworking operation depends largely on whether the resultant savings in lower processing and finishing costs is sufficient to justify the cost of the material plus the cost of applying and removing it. In some instances, it is revealed, protection afforded by such coatings when used on highly polished sheets is found to produce high grade finishes which are difficult, if not impossible, to produce by other finishing methods. In addition, the coating is reported to act in some degree as a die lubricant in forming operations, and to minimize die marks and other marring of surface finishes during fabricating operations. (p. 71)

Fig. 1—Press setup for piercing and coining wheel lug bolt holes. A prior operation dimples metal before piercing; dimples can be seen in the spiders at the lower right of the picture. Notice gravity roller conveyor and safety cables attached to press operator's wrists

Mechanized

...employs automatic methods to build automobile components

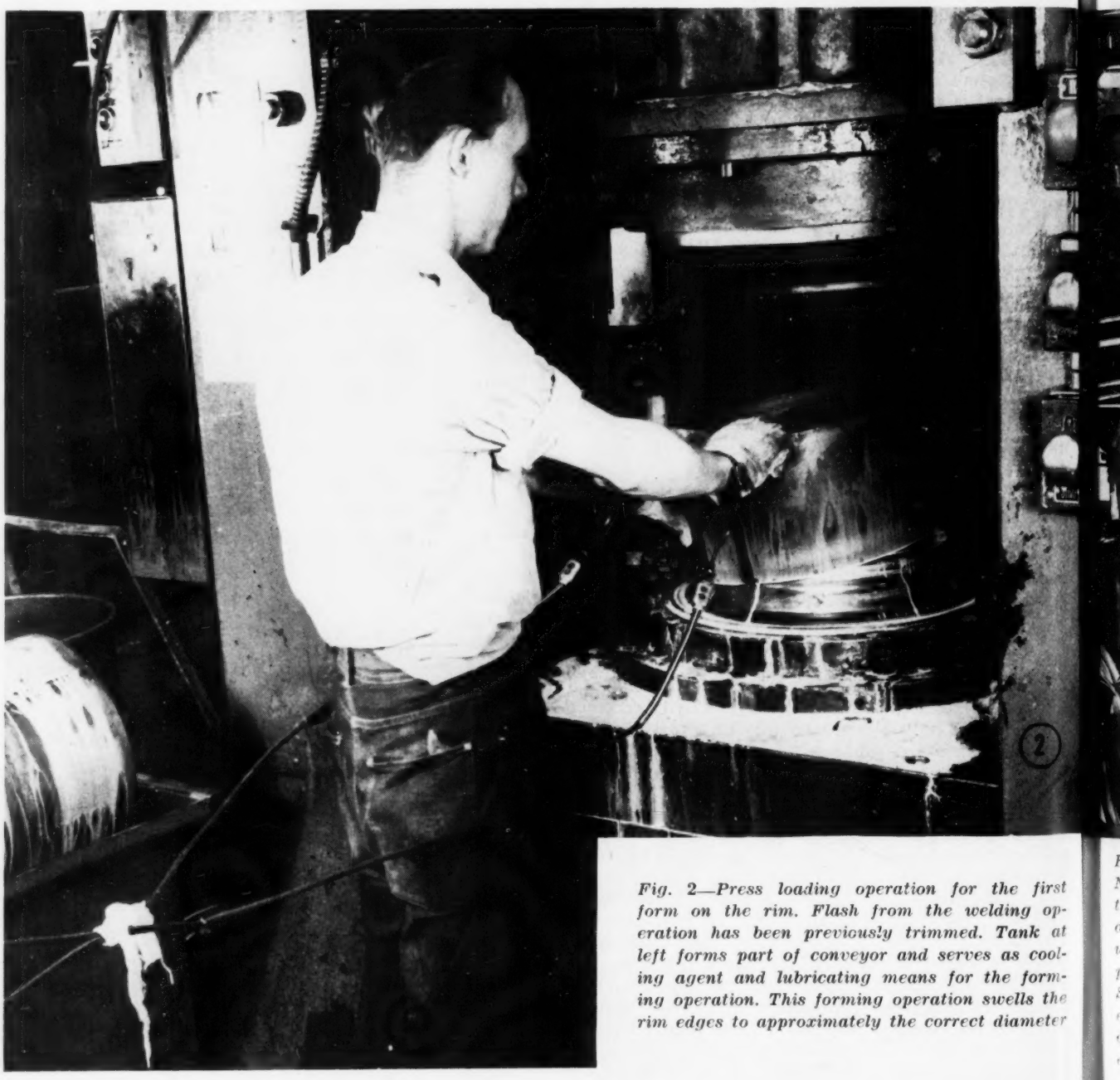


Fig. 2—Press loading operation for the first form on the rim. Flash from the welding operation has been previously trimmed. Tank at left forms part of conveyor and serves as cooling agent and lubricating means for the forming operation. This forming operation swells the rim edges to approximately the correct diameter

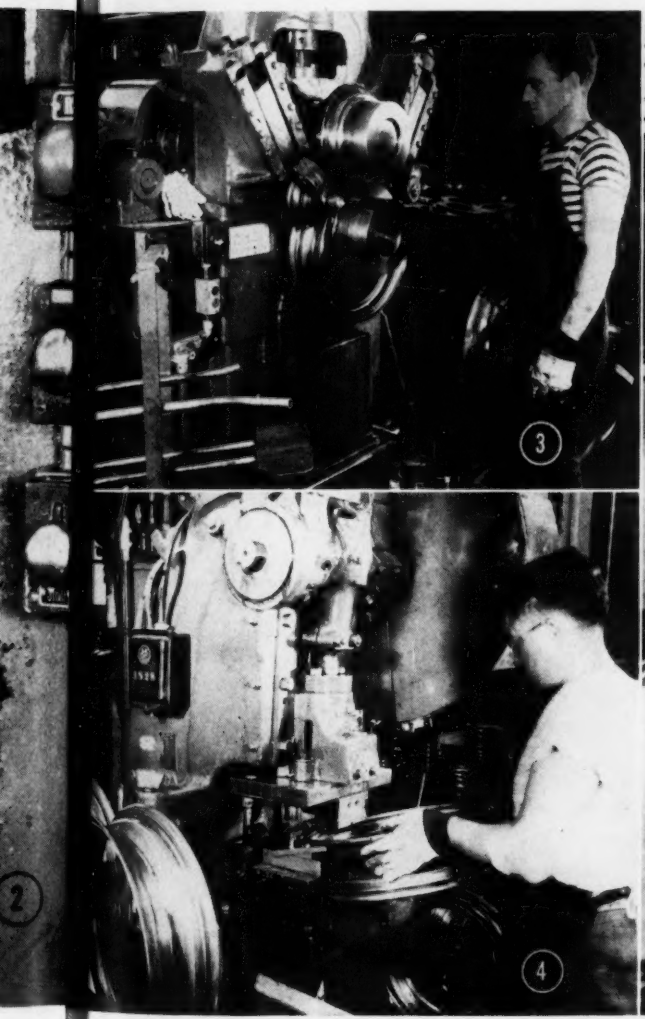
edWheel Line

THOROUGHLY mechanized setup for fabricating automobile wheels is employed by Norris Stamping & Mfg. Co., Los Angeles, to turn out completed units with a minimum of manual handling. Some idea of the range of operations and the degree of automaticity developed at this plant can be gained from the accompanying photographs.

Stock used for spiders is 0.130-inch hot rolled deep drawing quality steel, with gage held to plus or minus 0.008-inch; mill plate is pickled before use and after primary sizing. It is vaco-medium covered just prior to the first operation, which consists of shaping the center lug well. Following the operation shown in Fig. 1, the first line operation in the rim line consists of trimming the prior-sheared stock to exact net length, squaring and paralleling the ends for flash welding.

Using a Swift flash welder, rims are clamped in position, welded and ejected from the machine automatically, into a conveyor. This represents both a safety precaution and a reduction in manual operations required. Rims are hand-loaded into the welder; stops and aligning pins locate edges to be welded.

In addition to inspection setup shown in Fig. 7, a checkout table is located at the end of the assembly line. Here gages are kept for go and no go checking of rim width, tire seat spacing, drop center depth, tire seat circumference, hole size and spacing and alignment, and roundness. Wheels are checked periodically for die wear, gage variation in the metal and operation accuracy.



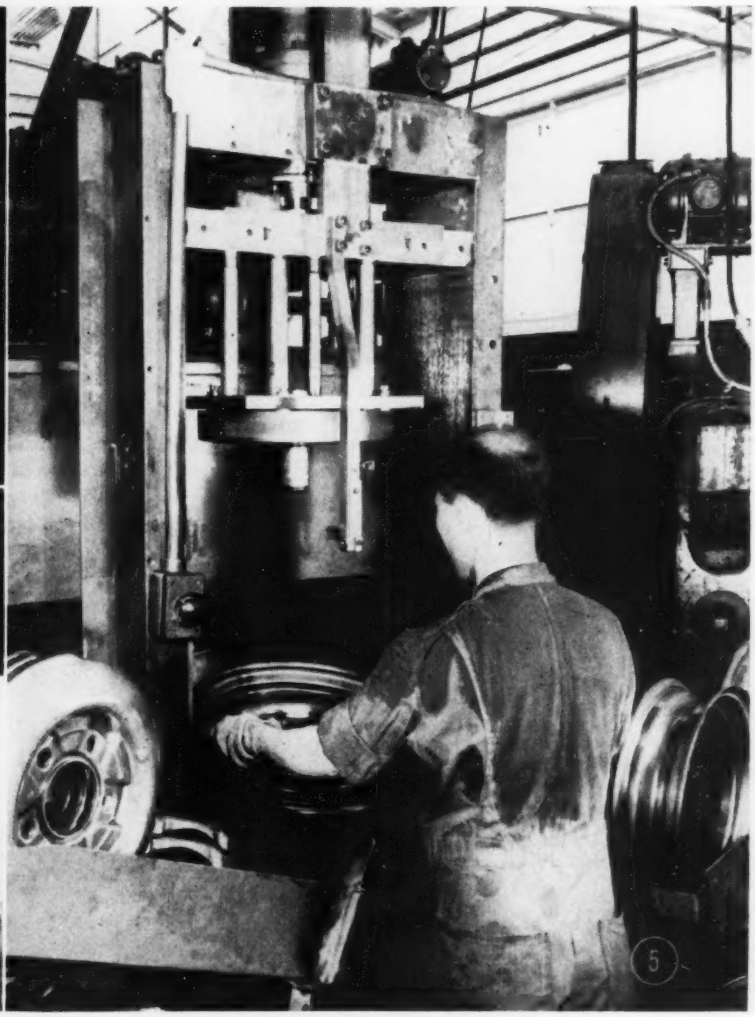
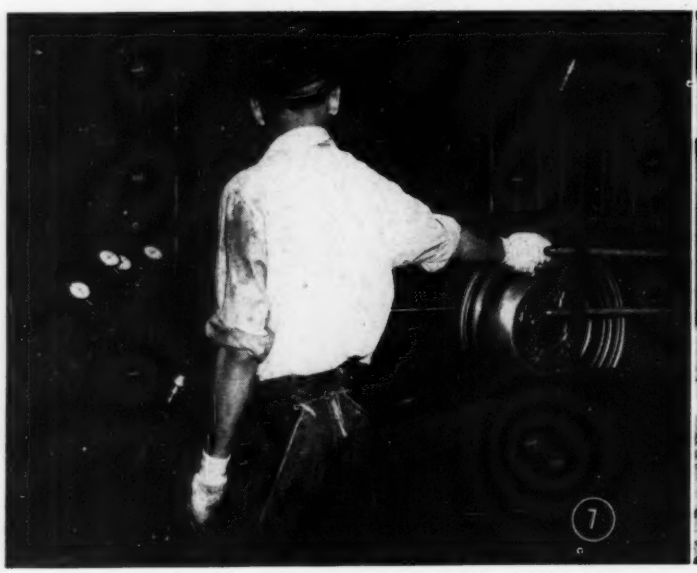


Fig. 3—This is the final forming step on the rim. The No. 5 Grotness rolling machine shown here drives the two matched rolls which shape the final cross section and burr the edge of the rim. Automatic loading and unloading device is not shown. Notice the two idling pressure rollers which maintain rim position in the rolls. Shape of rim from prior forming can be seen at the end of the conveyor, right center. Fig. 4—Punching operation for valve hole in the rim. Rims are visually checked at this point for obvious flaws in surface appearance. Two gravity conveyors, one to the rework station, enable the operator to segregate parts for minor burring, filing etc. Fig. 5—This press operation assembles the rim and spider. The spider is about a 100-pound press fit in the rim, enabling the wheel to be handled through the punching and riveting operation without loss of alignment. The die in this operation accurately aligns the spider in the rim. Notice the pickup and ejecting arm on the press. This tips the wheel into the conveyor behind the press. Spider and rim lines join at this point

Fig. 6—Rear view of the Williams-White 100-ton press showing a punched wheel coming down the conveyor from the press (left side). In immediate foreground is a pneumatic rivet inserting machine. Rivets are pressed into the punched holes through the spider and rim. The wheels are then sent back through the press as pictured in the right center, where rivets are set. This die operates in the same manner as the piercing die in the left side of the press



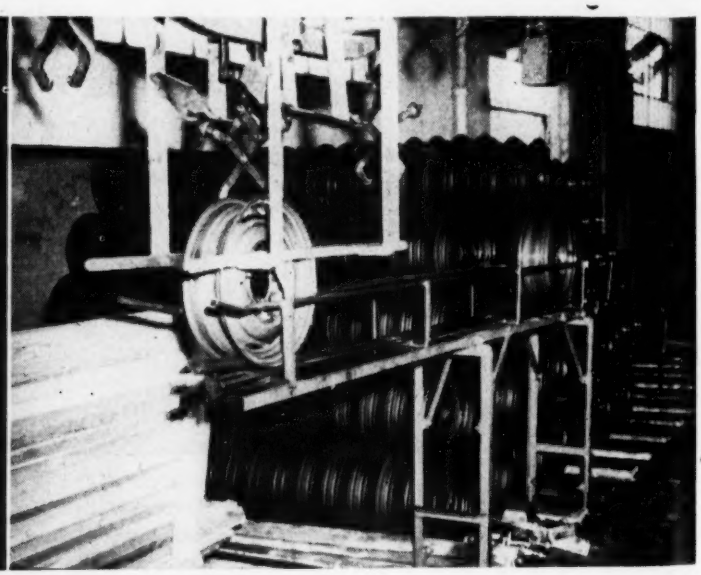


Fig. 7—Final inspection station located immediately following the riveting operation. Wheels are gravity conveyed from this station to a point where they are picked up by an overhead conveyor for automatic cleaning, Bonderizing, painting and drying. Every fiftieth wheel is completely checked. Shown are hub inspection plug and locating boss, indicator gages for checking rim eccentricity, rim, shoulder, and base diameter of rim, and runout alignment. Fig. 8—Conveyor unloading station and gravity ramp to door and railroad car beyond. The conveyor releases mechanically, requiring only one man at car end of gravity ramp to stack and load wheels

Strip Tension and Velocity Control

. . . key factors in continuous cleaning, plating and coiling steel venetian blind stock

By CHRIS DIECHERT
Life Time Products Corp.
Youngstown, O.

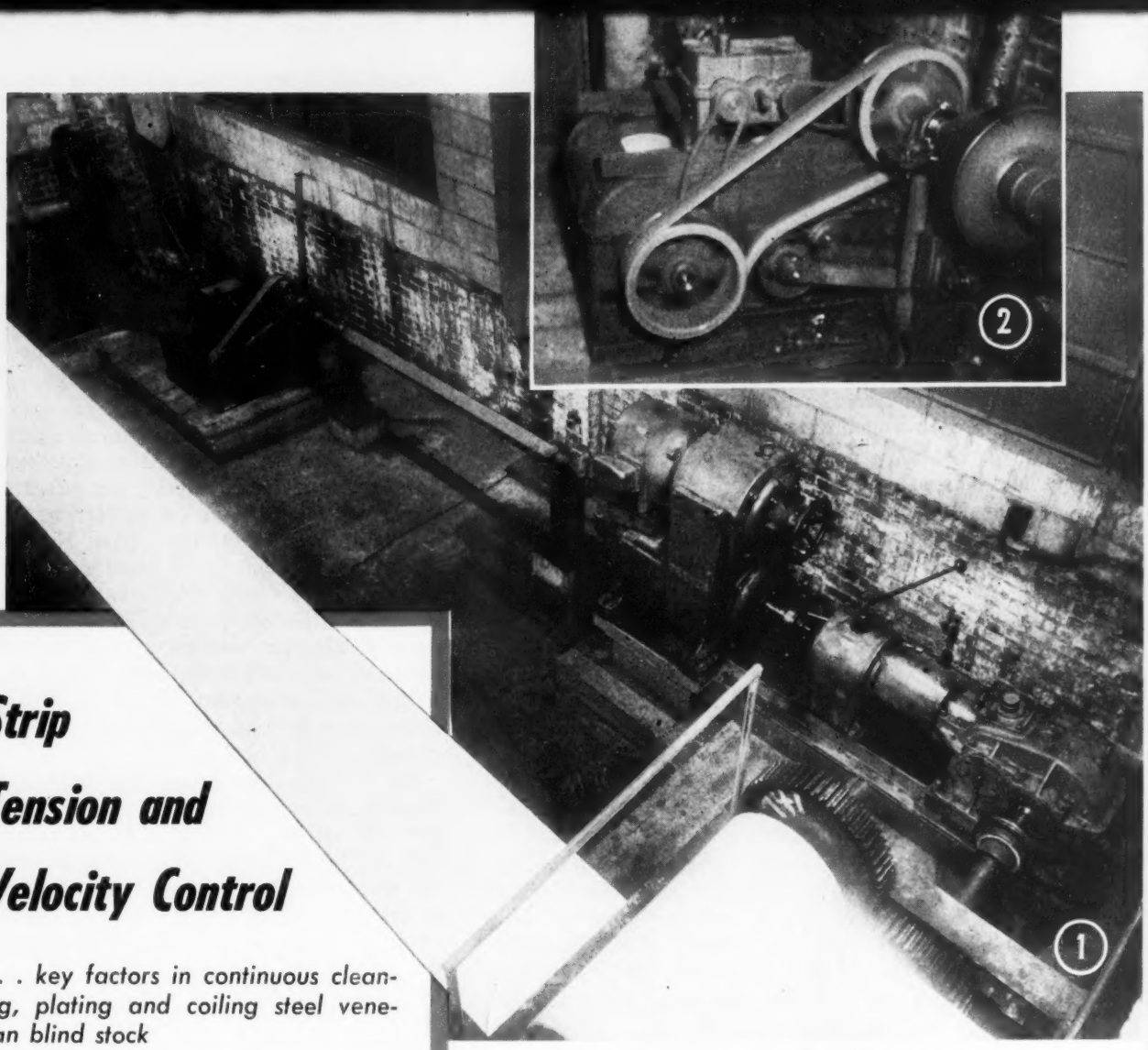


Fig. 1—Drive end of processing equipment showing pull-out capstan rolls, main drive, tension winding control transmission, recoiling stand

Fig. 2—Close-up of tension winding control showing torque measuring and adjusting unit, differential controller

ALTHOUGH use of steel for venetian blind slats constitutes an improvement in venetian blind design, it also involves a complex manufacturing procedure to provide and maintain close dimensional tolerance and perfect finish. Life Time Products Corp., Los Angeles, is now producing slat stock 1⅞-inch wide by 0.008-inch thick, formed in a slight arch to give rigidity and prepared in coil form so the blind manufacturer can readily punch and cut the stock to make the custom-built slats required.

One of the major problems in producing the slat strip is to prepare the steel for painting after it is rolled to the proper thickness. This is the critical process since the final coat of paint will not adhere properly at points where the material is stretched, or where there are even microscopic dirt inclusions. At the same time, the steel surface must be prepared to create a firm bond between metal and paint.

Continuous Cleaning—After many years of experimenting, it was found that the use of a careful cleaning procedure followed by electroplating a thin layer of zinc and then the application of a phosphate coating fulfilled the requirements for a good paint bonding condition.

Because of the tremendous amount of steel strip to be processed, and complexity of the system required to prepare the material satisfactorily for painting, it was determined that a continuous system should be developed, which would use the standard coil of steel as it is rolled by the mill. The strip is approximately 0.008-inch thick, 24 inches wide and coiled to 46 inches in diameter.

Pulled off the mill coil, the material goes through a precleaning and cleaning solution, through a rinse tank and over the series of five plating cells, which deposit the zinc electrolytically on one side of the

strip. The strip then moves back and is carried through another series of five cells to put the same amount of plating on the opposite side of the strip. Next it passes through a wash tank, a phosphate tank and a hot chromic acid tank to fix the phosphate coating on the strip. The strip is then recoiled for slitting and is ready for the baked enamel finish and forming.

Uniform Tension — To obtain a uniform plating thickness, it is necessary to maintain the strip at a uniform tension throughout this process. This is accomplished by using a brake on the uncoiling end of the system, and recoiling the stock after it is processed, at a controlled tension and velocity.

It is not only necessary to maintain tension in order to insure proper plating and processing in the system, but it is also necessary to recoil the stock without slippage on the finished coil, since any movement between layers at this point results in marking the strip. This would result in rejects after the stock is painted, since the baked enamel finish magnifies any irregularities in the strip or the coating.

Tension at which the coils are wound must be adjusted in order to insure that each coil lies exactly in line with the preceding one, since any extension of the material from a given center line, might result in damaged stock as the coil is being handled. In other words, the coil must be made up as a perfect package, in order to protect the strip material.

Tension and velocity control system used to accomplish this is shown in the accompanying photographs. Strip is handled through the system at 96 feet per minute and is uncoiled and recoiled on 16-inch diameter cores, which are built up to from 28 to 46 inches in diameter coiled. These coils weigh from 3000 to 6700 pounds when completed.

Variations in Plating Thickness—Amount of zinc deposited on the coil on the strip stock, rate of cleaning etc., is dependent upon the speed at which the strip is taken through the system. In order to take care of all of the variations in plating thickness and preparations used, the strip speed must be variable from 24 to 96 feet per minute. In this installation the main drive which sets the basic production rate of the system, is a No. 7281-E-12 motodrive. This powers the capstan rolls and serves also as the drive of the recoiler stand through the No. 1 transmission which is arranged with the differential type tension control.

A take-off shaft from the motodrive to the right side, drives directly to a four-speed gear box and then to the right angle gear, which in turn drives the capstan rolls of the system. The four-speed gear box is used to give the extremely low threading speeds that are sometimes required to provide additional speed range for plating conditions of a special nature.

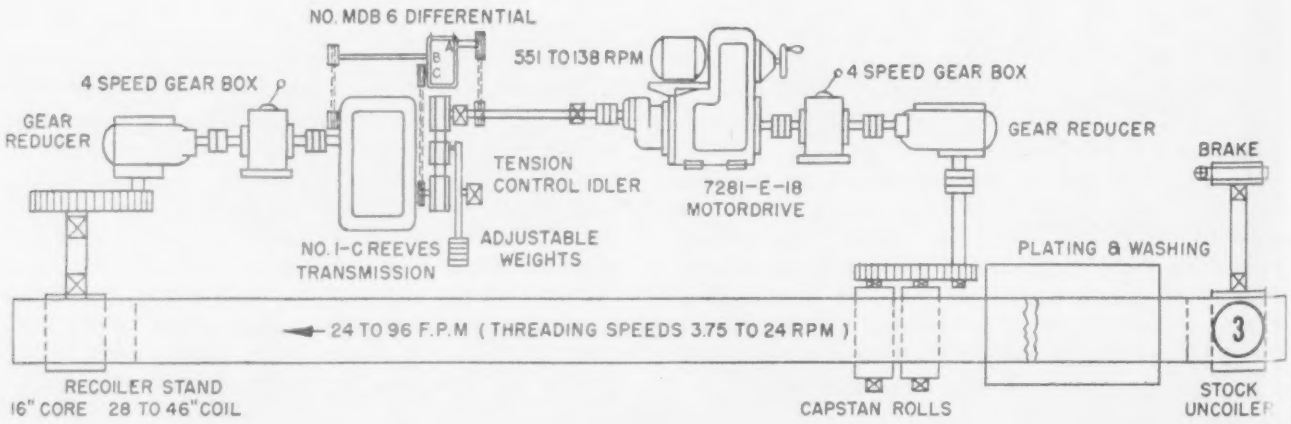
On the left side of the No. 7281 motodrive, the output shaft is a single helical gear reducer which gives output speeds of 551 to 138 revolutions per minute. This output shaft is directly connected to the shaft extension which serves as the driving shaft for the Reeves horizontal enclosed type, No. 1-c transmission. The constant speed shaft of the transmission is driven by a 4-inch double flat belt connecting the two 10-inch pulleys from the drive shaft to the constant shaft. The tension idler pulley bears on the underside of this flat belt drive, which serves as the control belt. Changing weights on this tension idler increases or decreases the amount of belt tension and capacity of this belt drive.

An MDB-6 differential, for velocity control, is mounted on top of the transmission with the A shaft driven from the constant shaft of the transmission and the C shaft driven from the shaft extension from the motodrive. Properly selecting the sprocket ratios of these two chain drives, gives the result that the B or center shaft of the differential rotates whenever the load on the control belt changes. The B shaft is then connected by chain and sprocket to the shifting screw of the transmission, which in turn sets the transmission variable speed to maintain constant load on the control belt.

Power Changes—Since the variable shaft of the transmission drives the recoiler block through a four-speed gear box at right angles through direct connections, any change in power required for winding the steel strip on the mandrel is reflected immediately by a change in power on the control belt, which in turn upsets the speed relationship between the A and C shafts and causes the B shaft to rotate in the proper direction to correct the speed of the No. 1 transmission.

The operation of recoil- (*Please turn to page* 102)

Fig. 3—Schematic diagram of slat strip processing setup



Organic Finishes

For Metal Products

This sixth part examines physical and chemical properties of vinyloid and chlorinated rubber base coatings, and notes some trends in synthetic coatings

Previous articles in the current organic finishing series appeared in the following issues of STEEL: May 17, p. 77, May 31, p. 56, June 14, June 28, p. 81, July 12, p. 97.

VINYL resin coatings are characterized by lack of taste, ("keg-lined" cans for beer) odor, or toxicity, and resistance to alcohol and water. In finishing metal products, vinyl resin coatings in their many variations are finding applications where resistance to abrasion, hard use and frequent handling, and resistance to caustic, moisture, and corrosive conditions must be combined with appearance. These properties are characteristics of the most widely used vinyloid in the protective coatings field for metals, namely, vinyl chloride-acetate copolymer.

These are manufactured in a wide range of molecular weights and in varying percentages of the components. In general, the higher the molecular weight and the higher the chloride percentage, the greater the chemical resistance, and the poorer the solubility and adhesion. In this instance we find an example which is illustrative of the formulation of all protective coatings for metal products; namely, it is always necessary to compromise. Thus, in most cases, to gain flexibility some hardness must be sacrificed; to gain durability some clarity must be sacrified; to gain adhesion often chemical resistance must be sacrified.

As has been emphasized, the selection of a finish for any metal product is dependent on the use of the end product. No matter what the product, it should be a balanced finish in which a single outstanding property is not gained at the sacrifice of other necessary and valuable properties. Just as the product must be a balanced finish, the accelerated tests used in its evaluation must be sufficiently broad in scope to cover all of its important properties.

Best solvents for the vinyl coating materials are certain of the ketones such as methylethyl ketone, methylisobutyl ketone, cyclohexanone and isophorone. The solutions tend to run to the viscous side, and some difficulty has been experienced in attaining high concentrations at spray or roller coating viscosity. Dispersions of these resins are now available.[50] Known as organosols, in non-solvents, they may be applied at solid contents of 50 per cent or higher, and the aggregation of small particles left as the liquid phase dries can be flash baked to cause fusion to a smooth film. This principle which is illustrated in Fig. 36 may find further adaptation to the application of the still less soluble vinyl resins to metal products.

Chemical resistance of the vinyl coatings is very high. In view of the fact that the coatings are nontoxic, they offer great opportunity in finishing metal food and cosmetic containers. Often sheet metal is coated for subsequent fabrication into containers. Although drying by evaporation, the elimination of solvent, and the fusing of the resin require fairly high temperatures for a few minutes, entailing the equivalent of a bake. Where it is not essential to get perfectly dry, nonblocking surfaces, brushing methods may be employed and the coating air dried with success. Vinyl resins, properly formulated, have been widely applied to sheet metal by rolling, the metal being later shaped into its final form.

Packaging in Vinyl Resin Coatings—Shortly after the war's end a large application of the vinyloid resins appeared. It was desired to wrap up large quantities of weapons and instruments held by the armed forces in such form that years later they could be easily and quickly put in service. To accomplish this, the large irregular shapes, such as antiaircraft guns, or ships engines are first given a skeleton of tape.

A thick solution of a vinyloid type resin coating is then sprayed on in the form of cobwebs, interlacing

Fig. 35—Strippable plastic coating used to protect base metal from surface defects during forming operations

to form a fine webbed structure. Over this, several heavy coats of vinyloid, usually in emulsion or latex form, are sprayed leaving a thick, tough durable film fitting exactly to the contour of the object. Within this casing silica gel or other water absorbent is placed; it is expected that material so protected can be put in use very rapidly. One of the products employed is a copolymer of vinylidene chloride and acrylonitrile—both of these being vinyloid in character,[51]

Strippable Plastic Coatings—By applying strippable plastic coatings, many of which are of the vinyl base type, to metal surfaces it is possible to protect the surface finish during many types of manufacturing operations. Substantial savings in cost of finishing deep drawn stainless steel parts have been reported by a number of stamping plants through the use of the strippable plastic coating which remains on the sheet through the fabricating operations. This is only one of several applications that have been developed, since several types of strippable plastic coatings are available and have been successfully used in protecting polished surfaces before forming and also during such fabricating operations as machining, punching, welding and selective finishing.

Whether a strippable plastic coating can be used to advantage in any particular metalworking operation depends largely on whether the resultant savings in lower processing and finishing costs are sufficient to justify the cost of the material plus the cost of applying it and removing it. The protection afforded by the strippable plastic coating when used on highly polished sheets, is found, in some instances, to produce finishes after fabrication which are highly attractive, and which are difficult, if not impossible, to produce by other finishing methods.

In addition, it is reported that the coating acts in some degree as a die lubricant in the forming operations.[52] Shown in Figs. 35 and 37 are stainless steel moldings having a strippable plastic coating which was used to protect the base metal finish during metal forming operations. This type of coating has been found particularly useful for minimizing die marks, scratches, and other marring of the surface finish in normal handling routine in fabricating operations involving stainless steel products, one of which is illustrated in Fig. 38.

An important use of the solvent and water dispersion type coatings is as a masking material during painting. They are also excellent for coating spray booths. Thus, after excess paint has accumulated, the coating with its deposit of paint can be easily stripped off. One unique application has been reported in which the strippable type plastic coatings are used to protect portions of metal parts during sandblasting. The material has also been found useful as an antispatter medium during certain welding operations.[53]

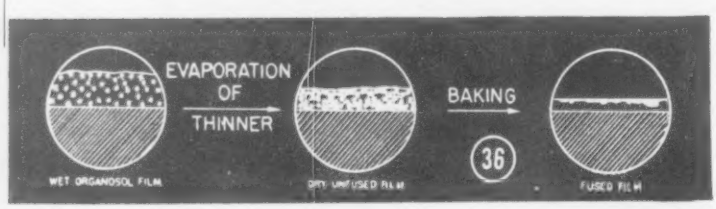


Fig. 36—Principle of formation of coatings from organosols

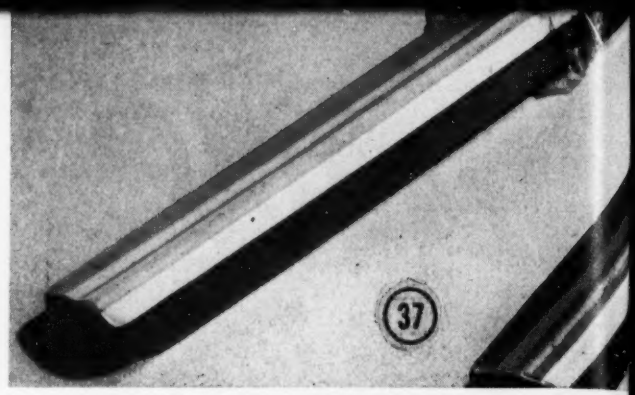


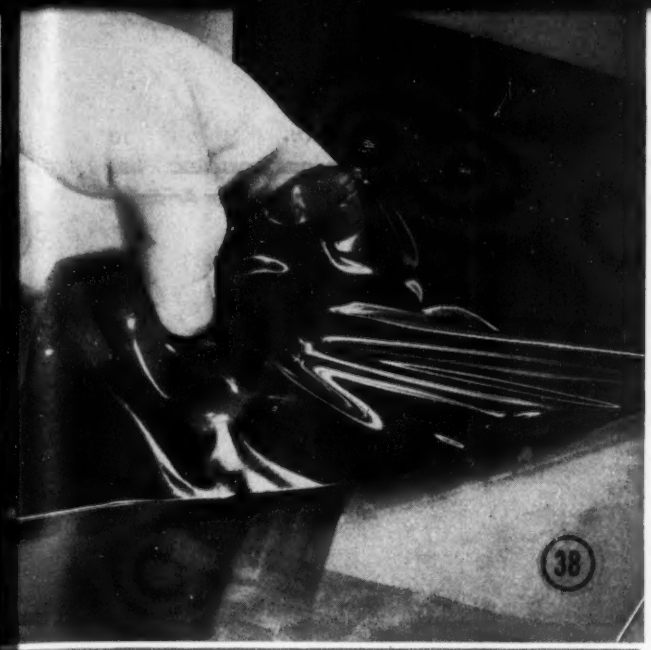
Fig. 37—Use of a strippable plastic coating to protect stainless steel molding during fabrication

Fig. 38—Strippable plastic coating used to minimize die marks and scratches during forming operation on stainless steel. Courtesy Better Finishes and Coatings Inc.

Acrylate and Methacrylate Types—The acrylate, and more particularly the homologous methacrylate esters, form a large group coming under the general vinyloid family. Acrylate coatings are sprayed on metallic surfaces as protective envelopes. This coating has remarkable extensibility and toughness, in addition to low moisture vapor transmission. The many proprietory products available to the finisher of metal products vary in hardness, flexibility, solvent resistance, thermoplasticity and certain other properties, depending on the esters used. It is generally considered that greatest hardness and best color retention at elevated temperatures, are obtained by the use of methyl methacrylate. Polymers of ethyl acrylate and n-butyl methacrylate are reported to give softer more flexible coatings.

Acrylate resins are used as clear metal lacquers for such metals as silver, aluminum, chromium and brass. They can be air dried, giving colorless films of better-than-average resistance to moisture, salts, alcohol and dilute acids and alkali. Under high heat they tend to depolymerize and volatilize cleanly from the metal surface. In some metalworking operations, they are used as shop coats which can be removed after fabrication of the metal article.

Chlorinated Rubber Base Coatings—Modified with plasticizer and resin and properly formulated, chlorinated rubber coatings of exceptional resistance to strong alkalies and acids, abrasion, water and mildew formation, may be obtained. Since rubber has long been used in providing corrosion resistant linings for various vessels, it is only natural that its possible use in paints should be studied. Although rubber itself is not soluble in the usual paint solvents and oils, chlorinated rubber is soluble, and a solution in toluol, for example, gives a clear, transparent, acid and alkali-resistant film. Chlorinated rubber base coatings are prominent in their ability to combine outstanding



chemical resistance, hardness and quick solubility on low-cost solvents with high speed of drying at room temperatures.

Chlorinated rubber resins are widely used in fortifying alkyd air-drying or low-bake enamels. Here it greatly accelerates the initial dry, quickly removing surface tack, and imparts acid and alkali resistance. The properties are particularly suitable for adoption in coatings for laundry equipment, metal-aircraft finishes, truck enamels, farm machinery and the like.

Chlorinated rubber formulated coatings, in common with other coating materials, have limitations. Surfaces exposed continuously to high temperatures must be avoided. Chlorinated rubber base paints are not suitable for continuous exposure to liquids above 140° F or to dry heat above 160° F due to the thermoplastic character of the chlorinated rubber.[54]

Chlorinated rubber is particularly adapted for the manufacture of industrial maintenance paints and quick drying enamels, which when properly formulated are finding increasing use under many different kinds of corrosive conditions. Alkyd finishing materials formulated with 20 per cent chlorinated rubber are also being used. Some applications of chlorinated rubber base paints are their use in ice cream truck finishes to resist salt corrosion; in undercarriages of cars and on license plates to combat road salt; in washing machines, commercial laundries, and bottling machines to resist soap alkali; on structural steel and equipment in acid plants and oil refineries to resist acid fumes; in bakeries and breweries to resist fungus and mold growth; and in many other uses.

Trends in Synthetic Coatings—Synthetic resins and materials are used, in one way or another, in nearly all types of protective coatings for metal products. One by one, synthetic resins have been found capable of replacing natural products and of imparting to the finished coatings, not only the desired properties of the product they replaced, but other superior properties, which make such replacement highly desirable.

Durability and service behavior of organic coatings are, to a large extent, determined by the physical structure of the coating and the manner in which the structure changes upon aging. This, in turn, is dependent on the composition of the finishing material both the continuous phase, the vehicle, and the discontinuous phase; the pigment, plays a determining part. Rate of change of structure is also influenced by environmental variables.

Considerable progress has been made within the past few years in attempting to relate the composition of organic finishes to their structure, and further progress can be anticipated for the future. Studies in the field of organic polymers of high molecular weight have been particularly helpful in understanding the structure of the continuous phase of the finishing media. Utilization of all these potential developments will provide the protective coatings industry with materials which possess greater ease of application and wider fields of usage. Thus, each type of organic finish for metal products has certain properties that recommend it for use in certain fields.

Within the past few years, an increasing appreciation has developed of the underlying mechanisms by which the failure of an organic coating may occur. Reduced to its barest essentials, the function of any protective organic coating is to prevent corrosion of the base metal, in the environment in which it is used. In most cases, however, a protective coating, in addition to providing protection against corrosion must enhance appearace, or perhaps fulfill some physical need such as abrasion resistance. When selected, it represents a compromise of such factors as these, as well as the cost considerations. Processing limitations frequently determine the ultimate selection at some sacrifice in the desired qualities of the protective coating.

Many organic coatings have failed to give satisfactory protection against corrosion simply because all the factors which accelerate corrosion or which make it possible to coat a surface efficiently are not understood. Considering the investment the manufacturer of metal products has in the actual cost of protective coating materials, together with the fact that the labor cost of application is usually several times the raw materals cost, it becomes evident that the proper selection and evaluation of protective coatings assumes a role of great importance to the economy of many metalworking and manufacturing plants.

In every case, the first question about any finishing material concerns quality. To be considered for a new application, or to be competitive with a material already in use, standards of durability and appearance must be met. In other words, the material must be capable of satisfactory service in the field. Importance of selection based on adequate service tests and the proper interpretation of these tests cannot be overemphasized.

(To be continued)

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Occupying positions of considerable metallurgical significance, the words "hard" and "hardness" nevertheless remain indefinite and complex. This article includes definitions suggested by investigators ranging from Aristotle, a discussion of the development of hardness testers based on scratch, rebound, penetration, magnetic and electrical principles and descriptions of common testers, in use today

Methods and Instruments for Hardness

HARDNESS and hardness measurements are frequently referred to in everyday usage as well as in technical fields. The term "hardness" is so common, in fact, that seldom is any thought given to its meaning; and when hardness measurements are used, significance of the property that is being measured is almost never considered.

Attempts to Define Hardness—One of the earliest references to the subject of hardness was made by Aristotle (384-322 B.C.) who defined as "hard" that which does not cede to penetration through its surface. By 1690 the concept was so well established that Huyghens referred to the variation of hardness with direction on the surface of crystals. In 1722 Reaumur, who has been called "the father of hardness measurements", devised a simple test for obtaining the relative hardness of two materials. One hundred years later a mineralogist, Mohs, said, "hardness in general may be defined to be the resistance of solid minerals to the displacement of their particles. The magnitude of this resistance is their degree of hardness".

Although various hardness tests were already being performed, Auerbach, in 1891, wrote, "Hardness, aside from its practical importance is one of the most remarkable properties of solid matter. This is shown at once by the difficulties which have been encountered in the endeavor to arrive at an accurate interpretation of it". In 1897, Jagger stated that "hardness is the resistance which a substance offers to permanent deformation by abrasion, penetration, friction or fracture."

Definitions were still forthcoming in the next century. In 1911, Iddings defined hardness as "resistance offered by the cohesion of the molecules to their being torn apart by abrasion". In 1917 the Japanese metallurgist Honda said, "Hardness is measured by the intensity of the maximum pressure applied to a surface, which just produces yielding and admits of the penetration of the body exerting the pressure". In this country, in 1924, Jeffries and Archer defined hardness as "resistance to permanent deformation". Mahin and Foss in 1939 distinguished between absolute hardness which they defined as "the intrinsic resistance of a metal to permanent deformation" and measured hardness which includes "the added resistance due to strain hardening, occurring after permanent deformation has begun."

When the various methods of measuring hardness are discussed below, the absence of an adequate definition will become even more apparent. Lest the reader get the notion that a word which cannot be defined is of no use, let him consider the inadequacy of our language if the words "hard" and "hardness" were to be omitted.

Development of Hardness Testers—Scratch Principle—One of the earliest scratch tests was that of Reaumur who, in 1722, measured hardness by noting the point at which the substance would begin to scratch a bar of gradually varying hardness. In 1822, Mohs devised a scratch test which is still used by mineralogists. He divided the hardness scale into ten parts using talc as the softest standard (Mohs hardness 1), diamond as the hardest standard (Mohs hardness 10) and eight other minerals for the intermediate values. By Mohs' method, hardness numbers between 1 and 10 are assigned to the materials tested depending upon their ability to be scratched by the ten standard minerals.

Seebeck in 1833, invented the sclerometer, a hardness testing machine with a loaded point which was given a translatory motion to produce a scratch on the test specimen. When this type of instrument is used so that the weight is increased until it is sufficient to cause a visible scratch, as was done by Franz in 1850, Grailich and Pekark in 1854, Exner in 1873 and Turner in 1887, the elastic limit of penetration is the property that is actually measured.

When used, as by Franz in 1850 and by Hugueny in 1865, to determine the force required to pull a loaded scratch point, the coefficient of friction is measured. In 1888, Martens used a modification whereby he found the load to produce a scratch of a given thickness. Still another variation was used by Pfaff in 1884 who obtained hardness from the

Testing

By A. M. WHITE
American Cyanamid Co.
Stamford, Conn.

Fig. 2 — Method of using the Barcol impressor on aluminum sheet

Fig. 1—Use of a rockwell superficial hardness tester for measuring case hardness of carburized rods. Machine at the left is a standard rockwell tester

weight loss caused by making several scratches across the crystal with a wide diamond.

Among the more modern scratch hardness testers there is one which was originally designed by Prof. L. C. Graton of Harvard and which was modified by Talmadge in 1925. Talmadge's method was similar to that of Martens but the instrument was better because it used a diamond point cut to very precise angles instead of a steel point which became dulled easily during use.

Another instrument of this type, described in 1923, is the Bierbaum Michrocharacter with which a microhardness number is obtained from the measurement of the width of a scratch made under a constant load. The point of the Bierbaum instrument is a diamond of such shape and dimensions that it can be reproduced with great accuracy.

Any list of scratch methods for determining hardnes should include the file test which is used for steel. This test consists of filing the steel sample and classifying it as "file-soft" or "file-hard" depending upon whether or not it can be scratched by the file. This test method, developed in production shops by practical shop men and not in laboratories by scientists, is used extensively by steel treaters in appropriate circumstances.

Testers Based on Rebound Principle — In the rebound-type of hardness instrument, the distance of bounce of a hard object dropped from a standard height onto the material being tested is converted to hardness. The distance of rebound is greatest for the hardest materials but the elasticity and coefficient of restitution of both the impinging object and the test material affect the results.

The Sauveur Durometer, described in 1907, was an early version of rebound testers. It measured the horizontal distance of bounce of a steel ball which had been dropped vertically onto the inclined surface of the specimen being tested. In 1934, Walzel devised a pendulum whose rebound angle was measured after it bounced off a vertically held specimen. The Shore scleroscope is a modern version of rebound-type hardness testers.

Testers Based on Penetration Principle—Reaumur, in 1722, measured relative hardness by pressing the edges of right angle triangular prisms of each of two materials into one another with their axes set at 90 degrees to each other. A similar test to measure the hardness of a single material was used in 1897 by Foeppl who made two semicylinders of the material to be tested and pressed the cylindrical surfaces into each other with the axes at right angles to each other. In 1920, Haigh used square prisms instead of triangular prisms and obtained actual hardness values.

In 1859 Calvert and Johnson described a hardness tester which used a truncated cone as an indenter. The hardness value was obtained from the load on the indenter which caused a penetration of a given depth into the material being tested. A present day modification of this machine is known as the Monotron.

In 1900, J. A. Brinell in Sweden showed his modification of the Calvert and Johnson machine. By Brinell's method, a constant load is applied to the test piece by a hardened steel or carbide ball and

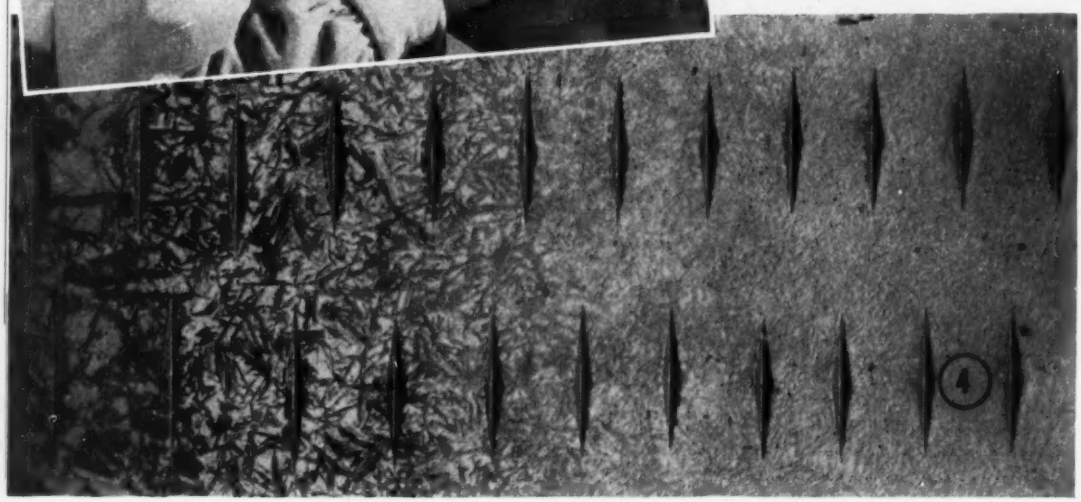

Fig. 3—Shore scleroscope in use

Fig. 2 — Method of using the Barcol impressor on aluminum sheet

Fig. 4—Knoop hardness survey on a quenched specimen of carburized abnormal steel. Magnification is 500

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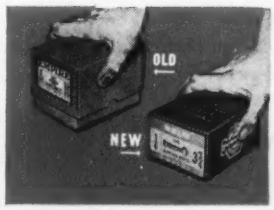

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the surface area of the impression thus obtained is divided into the load to obtain the brinell hardness number.

In 1922, S. P. Rockwell developed a hardness tester which measures the difference between the permanent penetrations caused by major and minor loads. By use of various loads and different shapes and sizes of penetrators, materials of widely varying hardness can be tested.

Also in 1922, Smith and Sandlund in England described the tester which is now known as the Vickers diamond hardness testing machine. The penetrator is a diamond in the form of a pyramid with a square base. The hardness equals the applied load divided by the suface area of the impression. The same form of diamond is used in the Eberbach microhardness tester and the Bergman microhardness tester by which light loads may be applied at microscopic areas selected under a microscope. The Eberbach instrument and the Bergman tester, which has only recently been marketed, make it possible to determine the indentation hardness of discrete microscopic particles on flat polished specimens.

A very recent development, the Barcol impressor, is a portable instrument which measures the depth of peneration into the surface being tested of a steel needle under a constant load.

A recent important development in penetration-type microhardness instruments is the Tukon tester which incorporates the Knoop diamond, an indenter developed at the National Bureau of Standards and made public in 1939. Because of the geometry of the diamond, whereby one diagonal of the impression is about seven times longer than the other, there is very little elastic recovery of the long dimension, thus eliminating one of the primary faults of other indentation hardness techniques.

By using an adequately light load the Knoop indenter can be made to confine its impression to microscopic areas. The Tukon tester permits application of the loads in a reproducible, shockless manner. A Vickers diamond may also be used with the Tukon tester.

Other Types of Testers—In 1923, Herbert devised a pendulum-type hardness tester, the principle of which depends upon the decrease in the effective length of a compound pendulum with a decrease in the hardness of the material being tested. Although this tester was unusually complex, it was satisfactory and reliable for many experimental purposes. Another type of pendulum for hardness testing was described by Jusnezow in 1931 and modified by Rehbinder.

For ferromagnetic materials the evaluation of hardness by correlation with magnetic properties has the advantage of not marring the specimens being tested. Such hardness testers have been devised and are adaptable for routine inspection work. For some materials, attempts have been made to utilize the relationship between electrical resistivity and hardness.

Macrohardness Testers—Brinell—The brinell hardness tester is widely used both in this country and abroad. Measurements obtained with this instrument are generally considered to be the standard to which other hardness measurements are usually referred. The brinell test can be used on reasonably large specimens and very little preliminary surface preparation is required. For steels, determination of brinell hardness may often be resorted to instead of the more complicated tensile test inasmuch as the brinell hardness number is very nearly linearly proportional to the tensile strength.

The brinell impression is relatively large, in the vicinity of 4.5 millimeters for soft steel, and is read to an accuracy of 0.05 millimeter. The large impression prevents detection of hardness changes within small areas but, on the other hand, gives excellent reproducibility of results.

Brinell testers have been made by several manufacturers but all the various modifications are operated in the same manner. The indenter is a carbide or hardened steel sphere, 10 millimeters in diameter. The load, which is applied hydraulically on a flat surface of the specimen, is 3000 kilograms and is applied for 30 seconds when testing steel and other hard materials or 500 kilograms for 60 seconds when testing soft materials. If tables are not available for

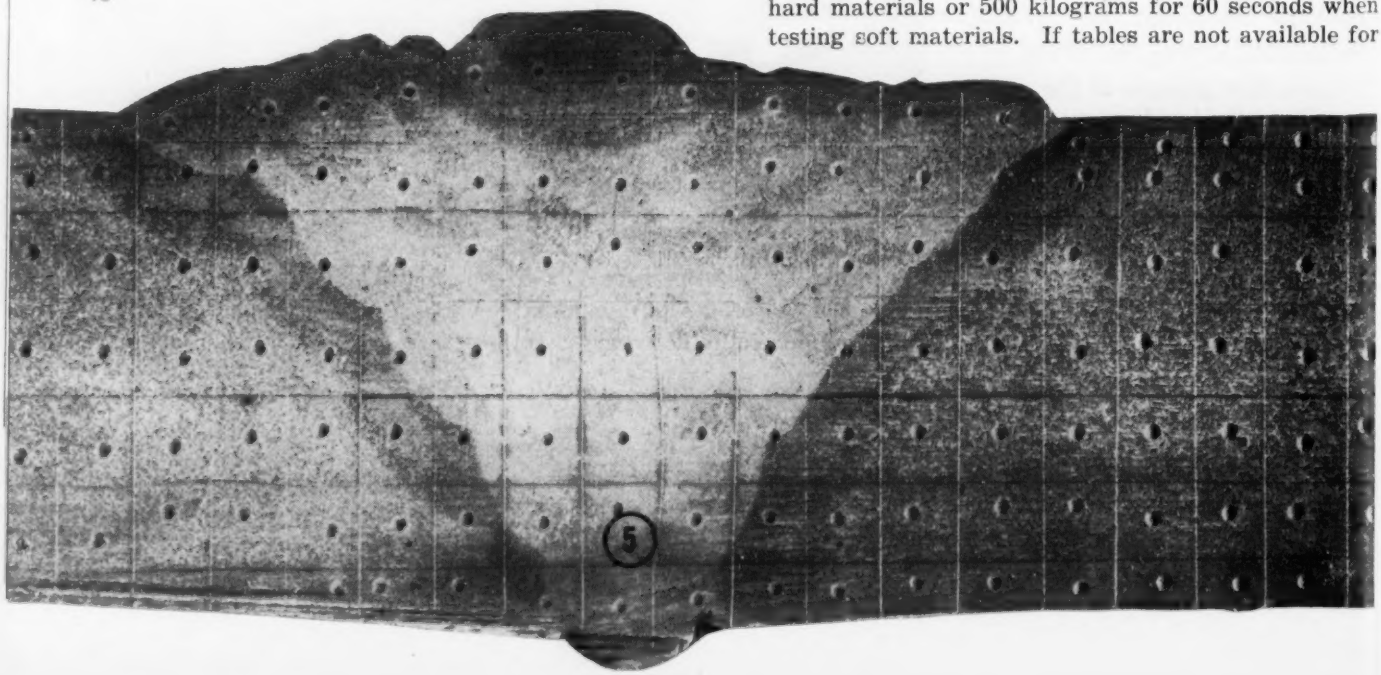
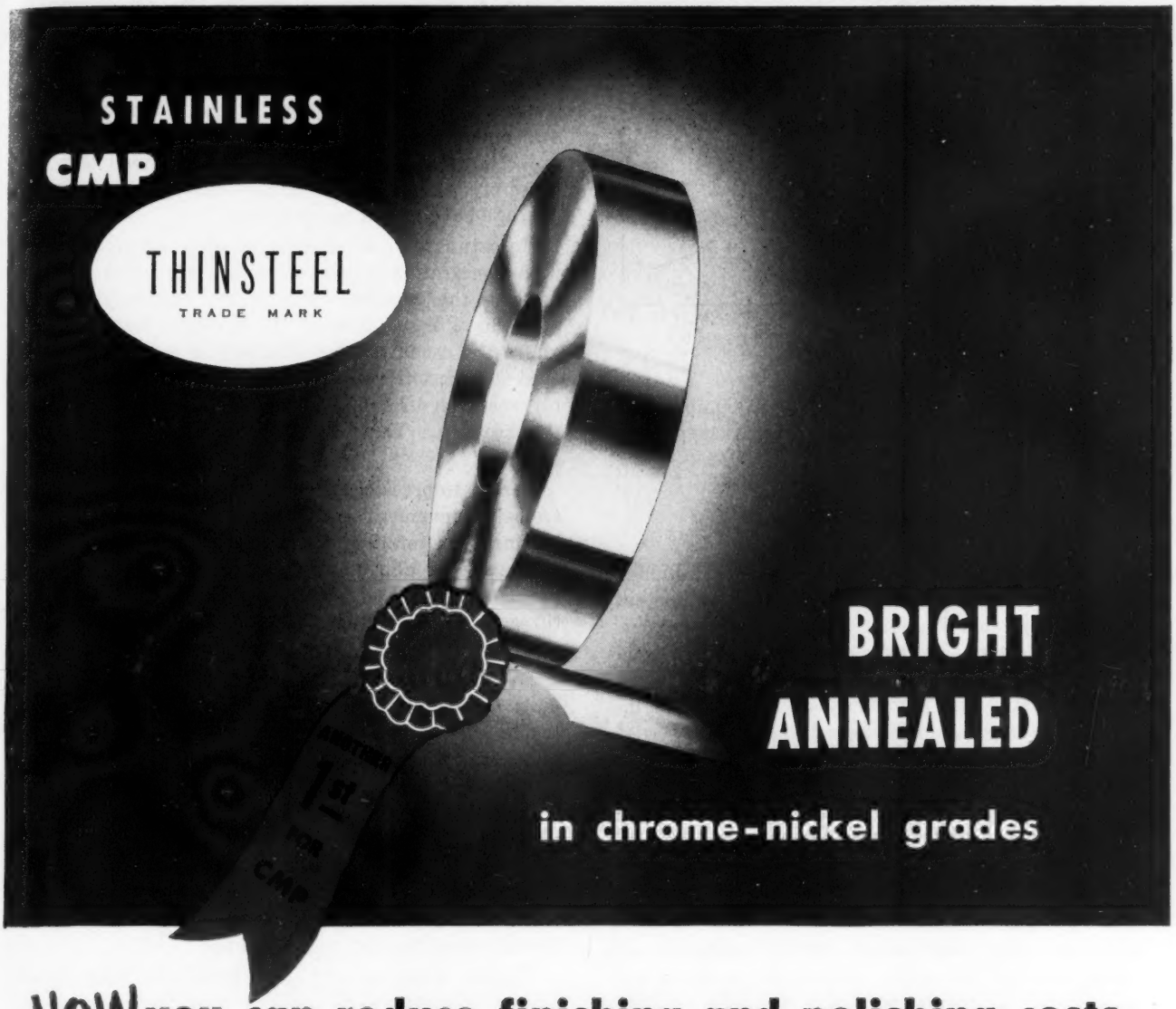


Fig. 5—Rockwell hardness survey on a welded specimen. Magnification on this photomacrograph is about 4X



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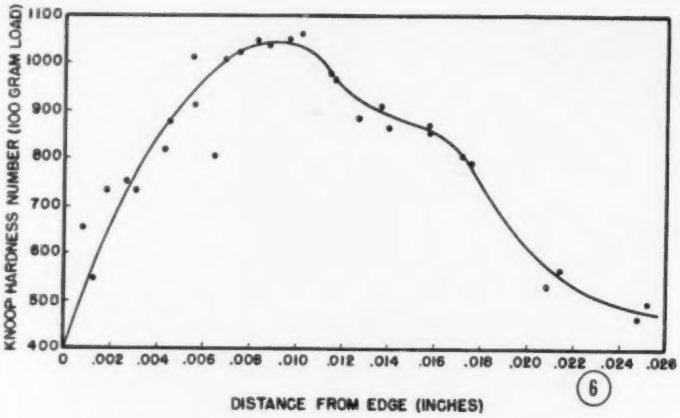

Fig. 6—Plot of data obtained by the survey illustrated in Fig. 4

direct conversion of the diameter of the impression into hardness, use is made of the formula:

$$BHN = \frac{P}{\frac{\pi D}{2}(D - \sqrt{D^2 - d^2})}$$

where BHN = brinell hardness number, P = applied load in kilograms, D = ball diameters in millimeters and d = impression diameter in millimeters.

Rockwell Tester — Perhaps the most widely used hardness testing device in this country is the rockwell hardness tester. The popularity of the rockwell instrument has resulted because of the rapidity with which reliable hardness readings may be obtained directly on a calibrated dial. Although it is primarily a tool for inspection of production parts or for process control, it can also be employed where more precise measurements are required, providing the specimens are carefully prepared and extreme care is exercised in the operation of the machine.

Actual measurement made with to rockwell instrument is related to the increment in depth between the permanent penetration caused by an initially applied small load and a large load. An impression on soft steel with a cone-shaped indenter and a 150-kilogram load has a diameter on the order of ½-millimeter and thus usually includes many grains, the average of whose hardnesses makes up the test result.

There are two types of rockwell testers: Standard and the superficial. The standard tester applies a minor load of 10 kilograms on a ball or "brale" (cone) indenter and uses major loads as high as 150 kilograms. The superficial hardness tester applies a minor load of 3 kilograms on a ball or "brale" indenter and uses low major loads. The superficial tester makes a shallower penetration for testing the hardnesses of "surfaces" or of thin specimens and must, therefore, be made with a greater degree of accuracy.

Shore Scleroscope—The Shore scleroscope is probably the most widely used of the rebound type hardness testers. It is useful for mass inspection of production parts or for obtaining the hardness of objects which cannot be brought to a hardness machine. The instrument is based on the principle that the height of rebound of a diamond-tipped hammer dropped under the force of gravity is a measurement of the hardness of the specimen from which it rebounds. The striking point of the scleroscope hammer makes an indentation whose diameter is on the order of magnitude of that of the rockwell test and, therefore, the hardness value obtained is usually the average hardness of many grains.

Unfortunately, anomalous results, when compared with penetration hardness values, are often obtained because the physical dimensions, elasticity and coefficient of restitution of the material tested greatly affect the results. The accuracy is generally considered to be insufficient to warrant the scleroscope's use for research or laboratory work. Scleroscope hardness numbers can be converted to other hardness scales.

Barcol Impressor—The Barcol impressor is an extremely convenient means of rapidly determining the hardness of relatively soft materials such as aluminum and its alloys, other soft metals and plastics. Speed and simplicity of operation are important features of the instrument which have promoted its acceptance for routine inspection purposes.

The impressor consists of a steel needle backed up by a strong spring and penetrating out of a sleeve. Inside end of the needle is attached to a dial gage in such a way that the dial moves from zero when the needle is not loaded to 100 when the needle is pushed in up to the edge of the sleeve. The instrument is operated by pushing on it with one hand. The reading obtained is independent of the applied force, providing it is greater than a certain minimum which is easily achieved. Barcol hardness is obtained directly from the dial gage reading.

Vickers Diamond Pyramid Hardness Tester—The Vickers diamond pyramid hardness tester is an accurate and versatile hardness tester of established reputation. It is particularly applicable for objects on which small indentations are desired or for materials of very high hardness for which the brinell tester does not give reliable results. Inasmuch as polished flat surfaces are required for valid results, the instrument is used primarily for research but a trained operator can make hardness readings with reasonable rapidity on production parts providing the surfaces are sufficiently smooth.

By using the lightest load, one kilogram, the diagonal of the square impression is on the order of 0.1 millimeter for soft steel. Such small impressions are advantageous because they do not seriously injure the surface being tested. The instrument, is, to some degree, a microhardness tester and is sometimes classified as such although the optical parts of the instrument and the rather large minimum load do not permit hardness impressions to be made on selected discrete areas of very small size.

Load on the diamond square-base pyramid indenter may be varied between one and 120 kilograms and is applied automatically for a definite length of time by a cam which is controlled by a dash-pot. Diagonals of the square impression are measured by means of a movable cross-hair in the ocular of the microscope.

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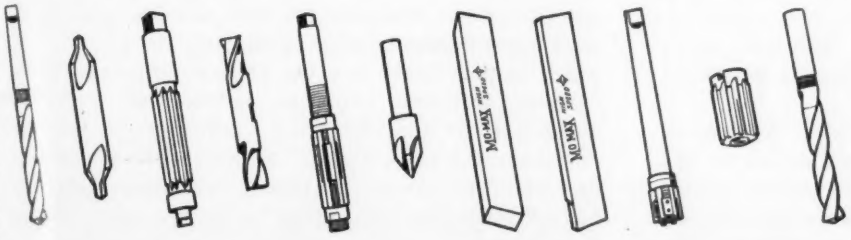
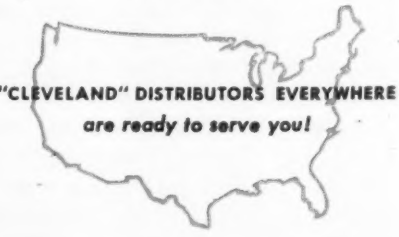




Hardness values are then obtained from a table or from the equation:

$$DPH = \frac{2\,L \sin \frac{\alpha}{2}}{d^2}$$

where DPH = diamond pyramid hardness, d = length of average diagonal in millimeters, α = 136 degrees = apex angle of indenter and L = load in kilograms. Values obtained are usually identical with brinell hardness numbers below about 300 but for greater hardnesses, DPH numbers are usually higher.

Microhardness Testers — Eberbach Tester — The Eberbach microhardness tester provides a means of obtaining Vickers numbers on extremely small areas. Although the applied loads are between about 7.5 and 555 grams, hardness values may be calculated by the formula used for the Vickers instrument because it utilizes the same type of indenter. The apparatus is attached to a microscope stage in order that indentations may be made on areas selected under the microscope.

Some users consider the instrument difficult to operate because loads are applied by compressed springs and the calibration of these springs is difficult and also because the electrical circuit used in the operation of the instrument is "temperamental". Despite such reported inadequacies the Eberbach instrument is a true microhardness instrument as evidenced by the fact that the maximum dimension of an indentation on soft steel would be on the order of 0.009-millimeter when a 7.5-gram load is used.

Bergsman Micro-Hardness Tester—Although it is still too new to have extensive use, the Bergsman instrument should be mentioned because it appears to have overcome many of the inadequacies of the Eberbach tester. The instrument attaches to an inverted-type microscope and permits indentations using directly applied loads from 0.5 to 500 grams and scratch tests with loads as light as 0.2 gram.

Bierbaum Microcharacter—The Microcharacter or Bierbaum scratch tester was designed exclusively as a research tool for metallurgists and microscopists. It is used on highly polished specimens sufficiently small to fit on the stage of a reflecting microscope which is used in conjunction with it. Inasmuch as the Microcharacter can produce a scratch 8 centimeters long, a great many grains or other microconstituents are marked at once under identical conditions. Thus, the Bierbaum apparatus is useful for making a standard scratch across adjacent grains for direct comparison of the widths of the scratch. Actual hardness measurements are not easily obtained, however, because of the difficulties involved in measuring the width of the scratch. This difficulty is often experienced with metals because the displaced metal piles up along the sides of the scratch and covers its true dimensions.

Another disadvantage of the Bierbaum instrument is inherent in scratch-hardness values because of the lack of constant correlation with indentation values such as brinell. However, in some instances, the resistance of a material to scratching might provide more pertinent information than its resistance to indentation.

Tukon Tester—The Tukon tester is a new microhardness instrument which is rapidly gaining in popularity and replacing other microhardness instruments in this country and in Europe. The instrument combines some of the best features of the Vickers and Eberbach machines and includes innovations as well. For precision results, each specimen to be tested must be carefully polished on a flat plane parallel to its base.

Two types of hardness measurements may be made with the Tukon tester, depending upon the penetrator that is used. A Vickers type diamond may be used with loads from 25 to 2600 grams or from 25 to 50,000 grams, depending upon the instrument model, to obtain diamond pyramid hardness. A Knoop diamond may be used with loads from 25 to 3600 grams to obtain Knoop hardness. The Knoop diamond makes an impression which, when viewed normally to the specimen, is rhombic in shape with one diagonal perpendicular to and about 7.1 times the other diagonal. Because of the geometry, the long diagonal recovers very little when the load is removed.

For a soft steel and a 25-gram load, the maximum dimension of the Knoop impression is on the order of 0.04 millimeters and the depth of the impression is about one-thirtieth of that. Under the same conditions, the diagonal of the Vickers diamond impression would be about 0.015 millimeter and the depth about 0.007-millimeter. The small impressions obtainable are evidence that the instrument is a microhardness tester often capable of disclosing the hardness of small microscopical constituents.

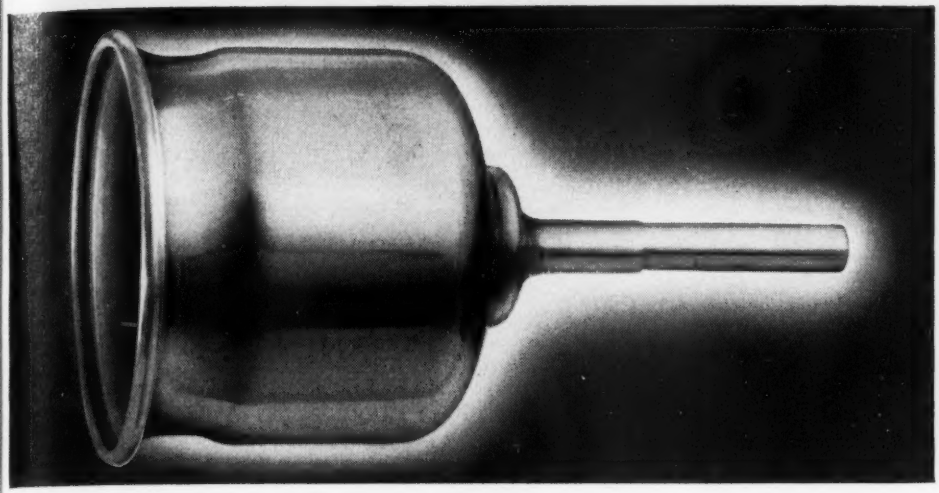
The Tukon tester is a highly mechanized instrument which automatically applies the load for a precise length of time and then releases the load. The loads are applied mechanically through a lever system which is activated electrically. Sizes of the impressions are measured with a micrometer eyepiece through high-power objectives.

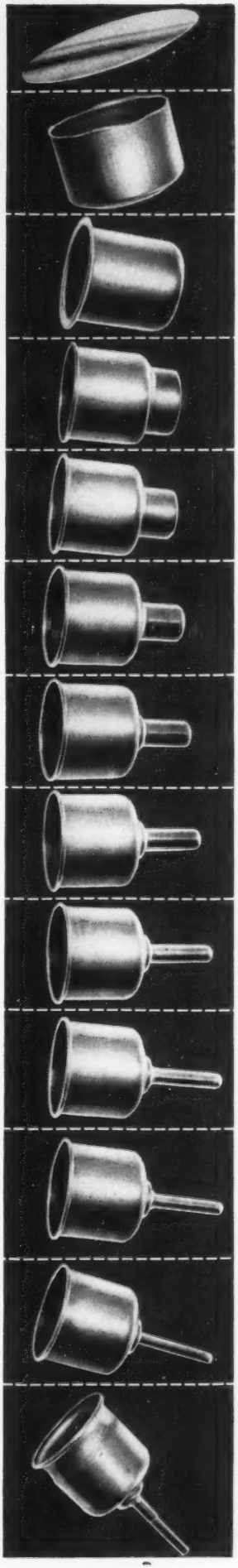
When the Vickers diamond is used, the measurement of the diagonal of the impression is translated into hardness by the same formula as for the Vickers machine. When the Knoop diamond is used, hardness is obtained from tables or from the formula:

$$KHN = \frac{L}{.07028\,l^2}$$

wherein KHN = Knoop Hardness Number, L = load in kilograms, l = length of long diagonal in millimeters, and 7.028×10^{-2} is the constant for an indenter of 170° 30′ longitudinal angle and 130° 0′ transverse angle which relates l to the projected area.

Portable Instruments—The instruments discussed, except for the Barcol impressor, and the scleroscope, cannot be moved readily from place to place. Inasmuch as portability is often of more importance than extreme accuracy, numerous instruments have been developed for approximating hardnesses on the various macrohardness scales. Manufacturers' literature and the previously mentioned references might be consulted to good advantage by anyone who has need for portable hardness testing equipment.





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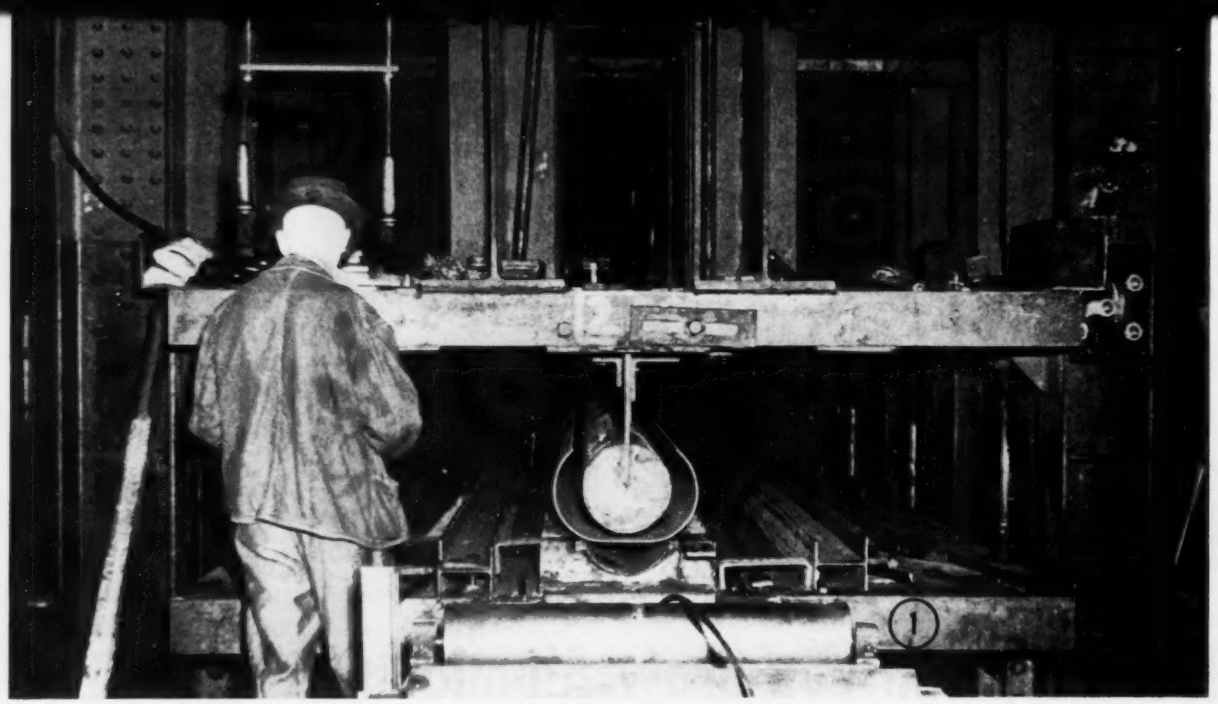


PRESS-FABRICATING PIPE

. . . on converted 36-foot press and specially designed welding mill

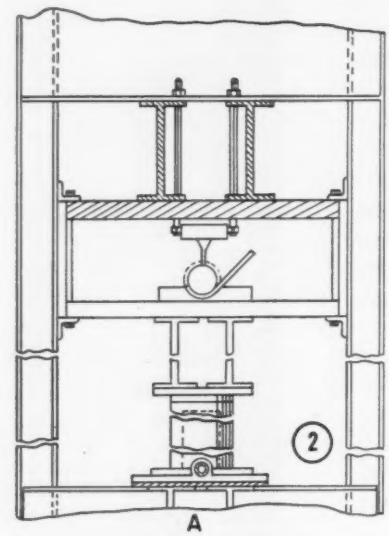
USING a 36-foot press powered with six 500-ton jacks, and a new welding mill, Fort Pitt Bridge Works recently entered the pipe fabrication field at its Canonsburg, Pa., plant. The press was utilized originally to form bulkhead plates for oil tankers (STEEL, June 12, 1944, p. 98). Over 50,000 feet of 10-3/4-inch outside diameter surface casing pipe with ¼-inch wall and welded couplings have already been shipped, fabricated by the new method.

Steps in pipe manufacture are illustrated in Fig. 2. As shown in Fig. 2G, a gap of 1½ to 2 inches remains after the final forming operation. When this gap is closed, the pipe remains round and straight throughout the entire length.

After forming on the press, the plate is put through the company's own specially-designed welding mill, Fig. 3. This unit consists of two stands of hour-glass driving rolls, in addition to three stands of idler rolls. Edges of the pipe are brought tightly together and welded by the submerged arc method. During the welding cycle, bottom of the pipe is heated with an acetylene torch to counteract welding heating expansion and to maintain straightness. It is reported that a large percentage of the pipe is commercially straight after the welding operation. A bulldozer is used in straightening pipe lengths which are slightly out of line upon completion of the welding.

At present the company is equipped to fabricate about 250 feet of pipe per hour; with some revamping of operating facilities, officials state they can increase output above 400 feet per hour. This will be accomplished by installing faster pumps on the press and by extending the 36-foot press 2 feet on each end, thereby making possible the forming of 40-foot length pipe. Increased welding capacity can also be accomplished in the revamping of facilities.

By this method, it is reported that a press can be constructed to form pipe one sheet to the ring for any diameter, length or thickness desired. The process is limited only to the economical practicability of the diameter, length or thickness of the pipe formed. Largest diameter pipe that can be formed on the present press is 10-3/4 inches outside diameter.



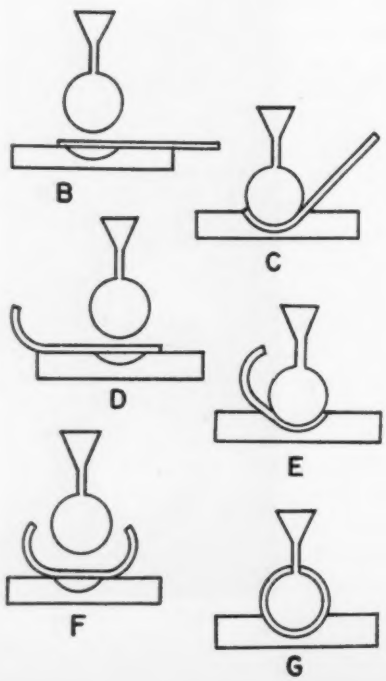


Fig. 1—Partially formed pipe in the 36-foot press, step G, Fig. 2

Fig. 2—Forming stages in the manufacture of surface casing pipe

However, pipe 2 feet in diameter and 2 feet long was recently formed satisfactorily on a pilot press consisting of one frame.

Short sections of pipe have been tested up to 2000 pounds per square inch; 36 foot length sections are also being tested up to 600 pounds. Performance in the field is reported to be entirely satisfactory.

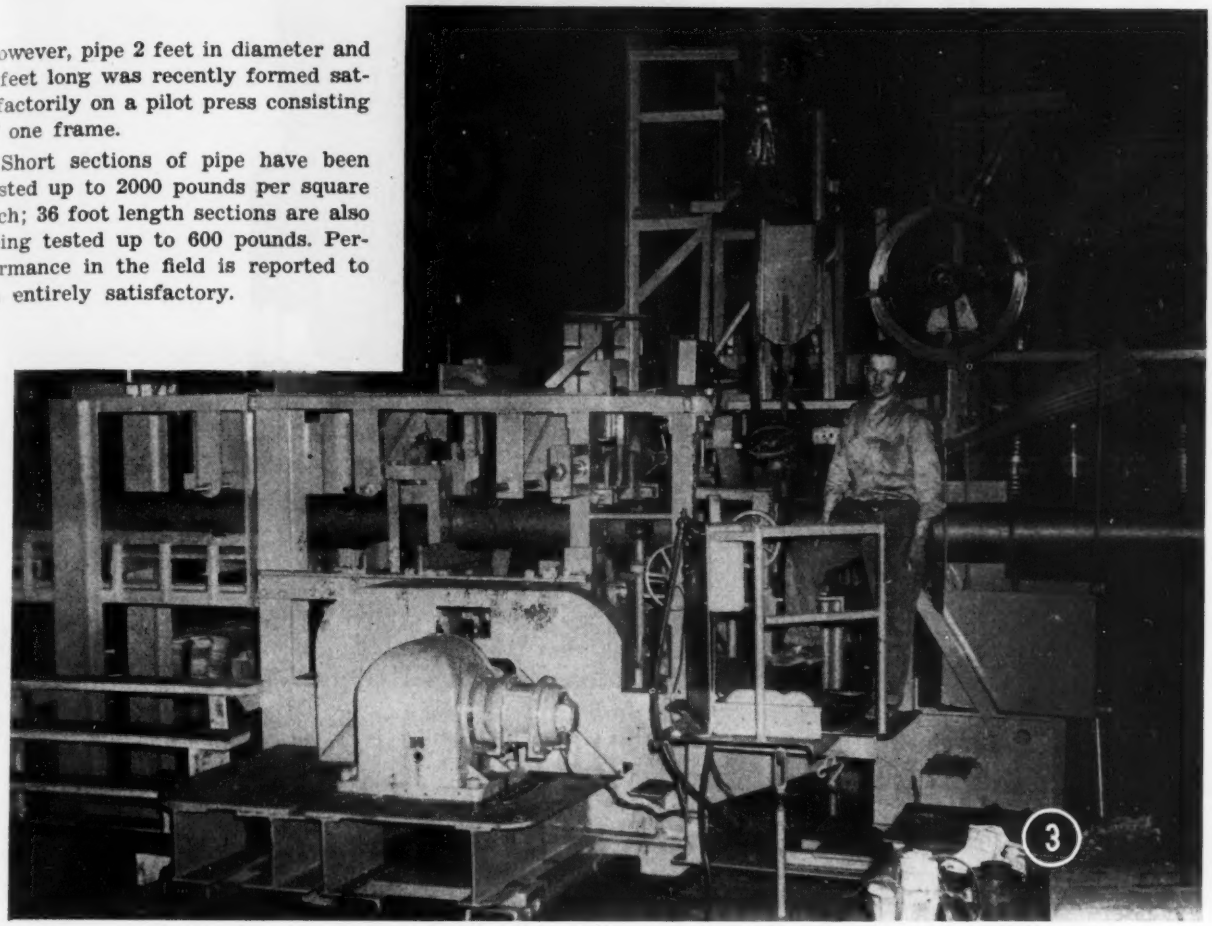


Fig. 3—Welding mill designed by Fort Pitt engineers

Industrial Relations Play Script Offered

Script of a play, "Foreman's Blues" or "Production Must Go On", is being offered by American Central Division, Avco Mfg. Corp., Connersville, Ind. Termed "something entirely new in employee-management relations, the play actually was produced in this plant, acted by union workers. It was stage over a three-day period, six shows a day.

The play graphically presents to workers one phase of management's problem. It depicts the difficulties of maintaining production. Intended for production on a stage, the play requires few settings and properties.

Committee Makes Exhaust System Recommendation

At a recent meeting of the sectional committee on safety codes for exhaust systems of American Standards Association, New York, it was agreed and strongly advocated that manufacturers of equipment, machinery and apparatus which in operation produces dust or fumes should provide housings and enclosures as an integral part of the design. The committee believes that such devices are just as essential as the guarding of gears.

Since manufacturers have the greatest knowledge of the working of their equipment, the committee feels that they are the logical persons to provide effective workmanlike enclosures with provision for proper exhaust system connections. While this practice may result in higher purchase prices, it is felt it will prove more economical in the long run.

Spot Welder Produces Automobile Dash Panels

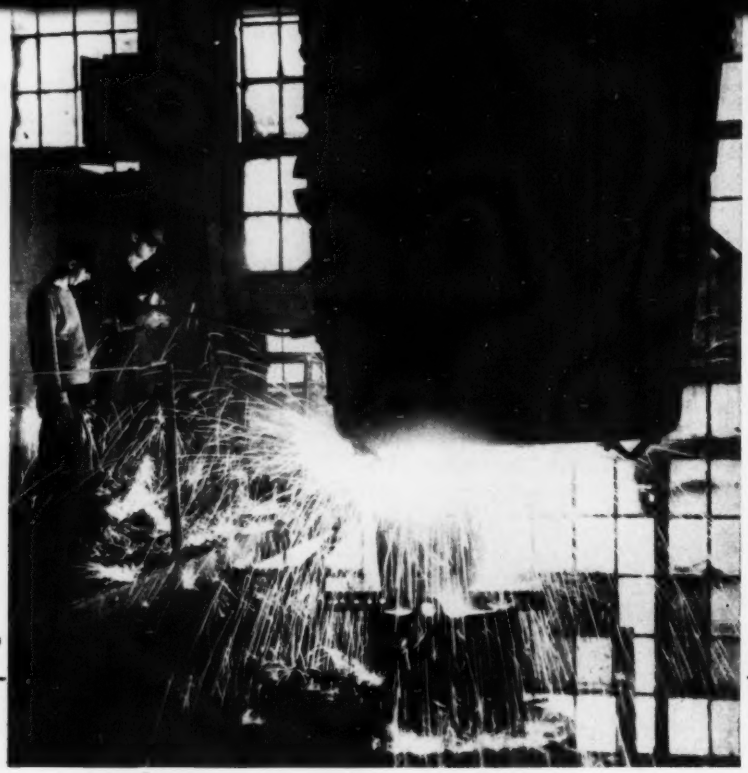
Utilizing two ultraspeed units, two watercooled transformers and 76 hydraulically operated welding guns, a special multiple spot welder manufactured by Federal Machine & Welder Co., Warren, O., produces 80 automobile dash panels per hour. The carriage unit, consisting of a suitable die holder, dies and necessary locators for positioning work parts, moves in and out of welding position by means of a integrally mounted hydraulic cylinder.

After parts are loaded and positioned by clamps, operator presses a button which starts the automatic welding cycle. During the actual welding, four welds are made at a time. Upon completion of the cycle, fixture moves out of the machine and the operator removes the assembly.

Diamond Powder Standard Submitted for Acceptance

Recommended revision of grading of diamond powder has been submitted to producers, distributors and users of this product for written acceptance according to an announcement from National Bureau of Standards, Washington. Present revision was proposed by Industrial Diamond Association Inc., and has been endorsed by standing committee for the commercial standard.

Standard covers six particle size ranges called micron sizes, used in fine grinding and polishing, and eight coarser size ranges called sieve sizes. A suggested form of identification, to indicate compliance with the commercial standard, is included.



MECHANISM OF NOZZLE EROSION

In Open Hearth Ladles

By R. B. SNOW
Research Laboratory
U. S. Steel Corp., Kearny, N. J.
And
JAMES A. SHEA
Ceramic Engineer
Metallurgical Dept.
Gary Steel Works
Carnegie-Illinois Steel Corp.

ENLARGEMENT of the bore of the refractory nozzle through which molten steel flows from the ladle to the ingot mold is probably influenced by the grade of steel teemed; the temperature of the steel; the composition and physical characteristics of the nozzle material; and the temperature to which the nozzle was fired in its manufacture.

On the basis of a limited number of tests, it appears that when fine-grained aluminum-killed steel is teemed through nozzles of differing heat resistance, amount of erosion decreases as the pyrometric cone equivalent (P.C.E.) of the nozzle increases. The P.C.E. of the refractory is the composition number of a thin pyramid of ceramic material, referred to as a cone, which bends at a given temperature. By referring to a given number in a series of such cones which bend at different temperatures it is possible to estimate the temperature at which a given mix may lose its ability to function as a refractory.

If rimming steel or higher manganese coarse-grained steels are teemed through the same type nozzle, amount of erosion increases as the P.C.E. increases.

Nozzle erosion and failure of higher P.C.E. nozzles when teeming rimming steels and higher-manganese coarse-grained steels is believed to be due to presence of open pores in the more refractory nozzles. These pores permit the FeO and MnO-bearing liquid at the steel-refractory interface to penetrate into the body of the nozzle and to soften the nozzle to a depth of as much as 0.10-inch beneath the surface of the bore.

Erosive rimming and higher-manganese coarse-grained steels might be successfully teemed through higher P.C.E. nozzles with a lower apparent porosity, but the present higher P.C.E. nozzles should be used only for teeming of fine-grained (aluminum-killed) or non-erosive coarse-grained steels.

Method of Testing—In order to obtain fireclay nozzle tests which were not contaminated by ladle slag and which at the same time would not interfere with normal teeming of the heat, the pouring stream of metal was sent through a cylinder 6½-inches long and equivalent in diameter to the bottom part of a nozzle. This so-called "nozzle extension" was placed beneath, and with its bore in line with, the bore of the regular nozzle.

Nozzle extensions were removed for examination after teeming one ingot of a given grade; a second extension of the same type was used on another heat of the same grade of steel and was removed for examination after teeming approximately 100,000 pounds of metal.

Three types of extension were made from regular fireclay having a P.C.E. of approximately cone 19. First type was given normal firing, the second was over-fired, the third being underfired. Kiln data for test extensions were not available but an examination of their physical properties shows that the percentage of closed pores decreased from about 10 per cent for those overfired to 4.5 per cent for those fired normally to zero for those underfired.

Extensions having a P.C.E. of cone 28 were made from a more refractory clay and another group with a P.C.E. of approximately cone 38 were prepared from calcined kyanite. All

Photos courtesy Ford Motor Company

KAOCAST

CAR TOP Tops them all

Faced with the need of producing thousands of pressed shapes in its small tunnel kiln, the Ceramics Laboratory of the Ford Motor Company encountered severe disintegration of car top refractories because of rapid temperature changes — from room temperature to 2300 F and back again in two hours.

A variety of refractory materials were tried—some very costly—but all failed after 20 to 44 cycles through spalling and cracking.

Then car tops were cast in three sections with KAOCAST. **These car tops went through 118 cycles and are still as good as new. The KAOCAST showed no signs of shrinkage, expansion, distortion, cracks or spalling.**

And, the perfection of the castings was astonishing . . . yet they were made quickly and easily by ordinary shop methods.

Perhaps you, too, have a problem in shapes, car tops or furnace linings which can be solved quickly and economically through the use of KAOCAST. Your local B&W Refractories Engineer will be pleased to supply data on this unusual refractory castable.

R-327

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...without extra equipment!

1.

COSTLY PROBLEM:

REJECTS WERE HIGH in this plant. Here was a manufacturer who had once used the chromium plating process, so thought it would be easy to resume. But with chromium plating, is limited experience ever enough? As usual, it wasn't. Within weeks, he found himself running into trouble.

2.

WHAT TO DO? The rejects were piling up. Production was lagging 'way behind schedule. The cost of the operation was becoming prohibitive.

3.

AH, HERE'S THE ANSWER! This manufacturer decided to go to United Chromium for help. He signed up for U.C. Technical Service. An engineer was sent to uncover the trouble.

4.

AND THE DISCOVERY! Through an analysis, the U.C. Engineer proved the need for an adjustment of the plating solution. He also advised cutting space between electrodes.

5.

AND THE DIVIDEND! Here was the "extra." The U.C. engineer showed the plater how to put *twice* as much work into the *same* tank! And he pointed out how better results could be obtained with adjustments of bath temperature and plating time.

6.

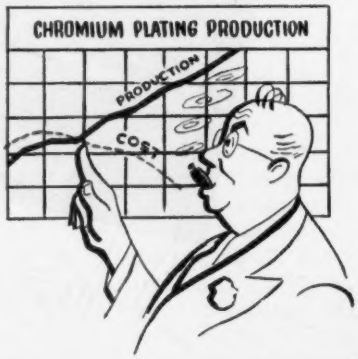
THEN...THE PAY-OFF!

The outcome was quickly evident: *Tripled* production! And operating costs were held at bed-rock level!

• • •

It's this kind of technical service, and the *20 years* of experience behind it, that can show *you* how to boost output, cut costs, and maintain the standard of chromium plating quality you desire.

It will pay you to write for further information. Ask for a copy of our Bulletin No. CR-2.



UNICHROME

Trade Mark Reg. U. S. Pat. Off.

UNITED CHROMIUM, INCORPORATED

PROCESSES AND MATERIALS FOR SURFACES THAT SURVIVE

51 East 42nd St., New York 17, N. Y. • Detroit 7, Mich. • Waterbury 90, Conn. • Chicago 4, Ill. • Dayton 2, Ohio • Los Angeles 13, Cal.

the above groups were made and fired by commercial processes.

Steels used were rimming, X-1335 and X-1315 both coarse and fine-grained, 1040 both coarse and fine-grained as well as rail steel. The principal difference between fine and coarse-grained steel is that for the former from 100 to 250 pounds of aluminum is added in the ladle, whereas for the latter not more than 30 pounds of aluminum is added. Extra sulphur and manganese are usually added to the X-1335 and X-1315 grades. Usual size of heat was 145 net tons.

Results of Tests—The limited number of tests show that for fine-grained 1040 steel erosion decreases as the refractoriness of the extension increases. Thus the erosion was 24.5 per cent for the normally fired regular fireclay (cone 19) and 16.0 per cent for cone 28 type of fireclay, whereas there was a decrease of 7.8 per cent in the diameter of the bore of very refractory cone 38 type.

On the other hand, the amount of erosion caused by the rimming steel increased from 13.8 per cent for the normally burned regular fireclay to 26.8 per cent for cone 28 type and to between 38 and 47 per cent for cone 38 type. The coarse-grained higher manganese steels (X-1335) followed this same general pattern although they show a greater erosion for cone 28 type (34.2 per cent) than was shown by the rimming steel (26 per cent).

Bore surfaces of the regular and cone 28 extensions used during the teeming of fine-grained steels were rough and irregular; numerous steel droplets were frozen onto the surface. The corundum (Al_2O_3)-glass tufts which cover the surface of a nozzle bore of this type cause it to have a nonglassy rough appearance. Cross sectional view of the nozzle bore shows not only roughness of the serrated surface and the corundum-glass layer but also the underlying relatively unaltered and bloated portion of the nozzle which is 0.10 to 0.15-inch in thickness. The dark grey corundum-glass layer contains many steel pellets and is similar to the corresponding material found as scum on the surface of fine-grained ingots.

In the case of cone 38 extension, the build-up inside the nozzle consisted of powder-like crystals of friable incipient corundum in a sintered network of small steel pellets. The interior surface of the built-up layer was smooth with no steel droplets frozen onto it. In addition the corundum-metal network easily separated from the nozzle extension at the original bore surface.

On coarse-grained erosive or rimming heats, core surface of all the regular type extensions had a fused glassy appearance but droplets of metal were usually frozen to the furrowed surface. The surface liquid was estimated to contain 40 to 50 per cent of FeO + MnO based on the high refractive index of the glass while the colorless, bloated, underlying layer was 0.05 to 0.15-inch in thickness. The bloated material had not been contaminated to any appreciable extent by the iron oxide or manganous oxide of the surface layer.

In the cone 28 extension only a very thin light colored layer separated the glassy bore surface from the unaltered fireclay and bloating was not observed. In the case of cone 38 extensions the black surface liquid had penetrated the refractory adjacent to the bore surface to the depth of as much as 0.10-inch.

Mechanism of Nozzle Bore Erosion—A. Fine-grained, aluminum-killed steel: Since the corundum-glass layer found within nozzle extensions used on fine-grain heats does not flux the nozzle material, we believe that friction of steel against the rough surface of the bore is one of the chief causes for the erosion of regular and cone 28 nozzle extensions. The rough surface in the regular nozzle is underlain by material which does not fail under its own weight until the temperature range of 2715 to 2875° F is reached, though it starts to soften at 2200° F. This softening and bloating permits the surface layer to be easily torn away by the friction of the steel stream, even though the bloated clay is highly viscous.

In cone 28 extension the fireclay beneath the rough surface fuses at a higher temperature than does regular clay, which makes removal by the friction or wash of the metal stream more difficult than in the case of the regular nozzle.

In cone 38 extension the nozzle mix is not fused at steel pouring temperatures unless fluxes are present and therefore the corundum surface coating does not adhere to the nozzle bore. The manner in which the network of steel pellets and corundum crystals form is not known.

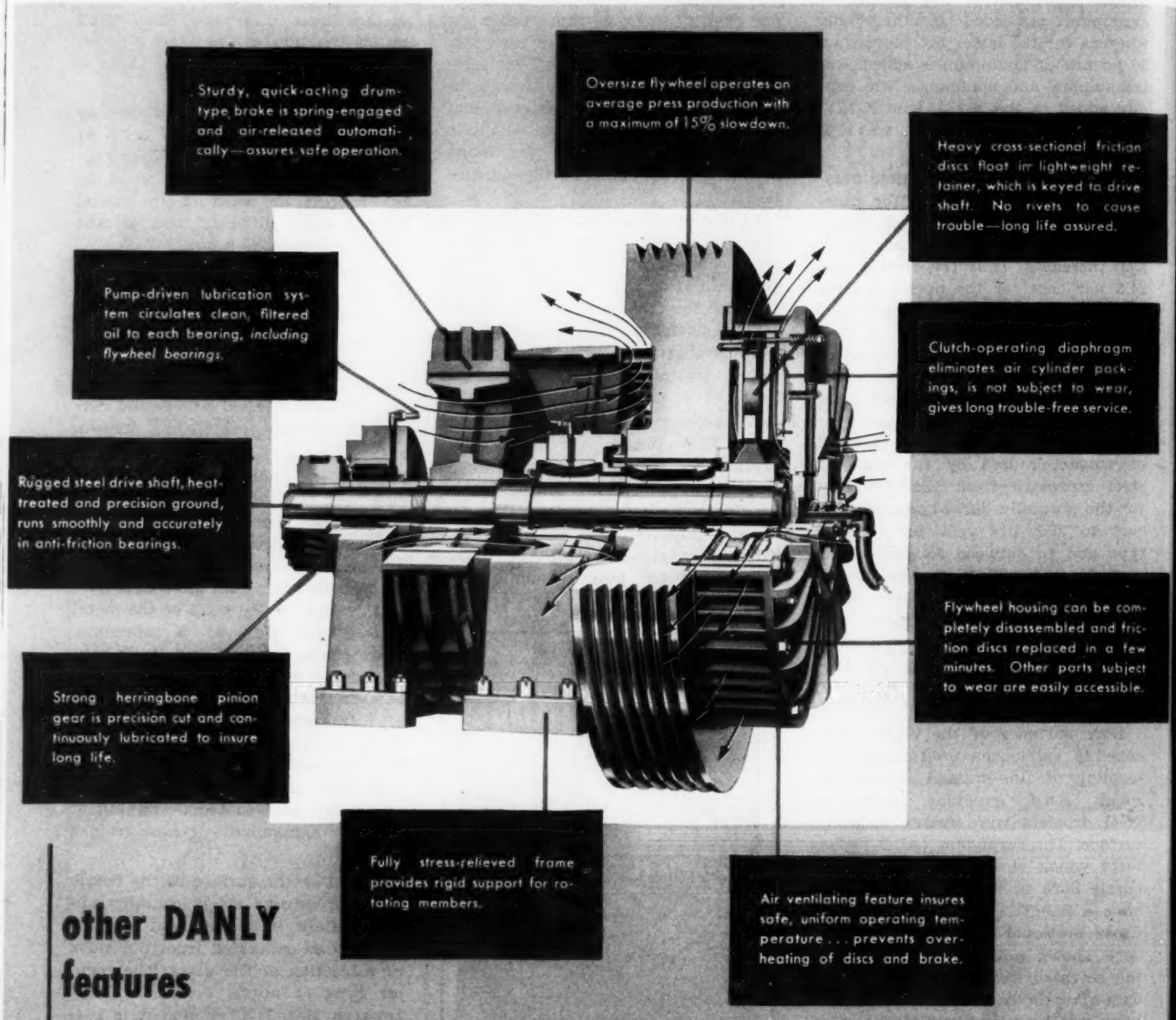
B. Coarse-grained and Rimming Steels: The small amount of erosion for the coarse-grained 1040 steels and the rail steel, teemed through the regular extensions, must represent the case in which attack by FeO and MnO on the nozzle bore and erosion by the wash of the metal stream are both at a minimum. Since the surface of these tests contained the least amount of FeO and MnO as estimated from the index of refraction of the glassy surface, liquids formed had the highest melting temperature and were more viscous than any found on the surface of nozzles used to teem rimming or higher manganese coarse-grained steel.

Liquid on the surface of the nozzle bore for erosive steels contains approximately 40-50 per cent of FeO + MnO as estimated from the index of refraction of the glass. The regular type of nozzle begins to bloat between 2200-2400° F and it is possible that the bloated zone is not only viscous enough to resist the drag of the metal stream (except in the case of fine-grained steels), but is also effective in sealing off the bore surface from sub-surface layers in which the pores are continuous, and so keeps the fluxing action of FeO + MnO with the nozzle material confined to the surface.

In cone 28 extension only a very thin light-colored layer separated the glassy bore surface from the unaltered fireclay and no bloating was observed. Thus greater erosion may be caused by the open pores in the

NEW LOOK: Typifying gray iron foundry operations, a new emblem featuring a cupola and receiving ladle was recently adopted by Gray Iron Founders' Society Inc., Cleveland. Plaques which are deeply etched in two tones of silver and mounted on walnut are now being distributed to more than 600 member companies

HOW A NEW CLUTCH DESIGN


Sturdy, quick-acting drum-type brake is spring-engaged and air-released automatically—assures safe operation.
Oversize flywheel operates on average press production with a maximum of 15% slowdown.
Heavy cross-sectional friction discs float in lightweight retainer, which is keyed to drive shaft. No rivets to cause trouble—long life assured.
Pump-driven lubrication system circulates clean, filtered oil to each bearing, including flywheel bearings.
Clutch-operating diaphragm eliminates air cylinder packings, is not subject to wear, gives long trouble-free service.
Rugged steel drive shaft, heat-treated and precision ground, runs smoothly and accurately in anti-friction bearings.
Flywheel housing can be completely disassembled and friction discs replaced in a few minutes. Other parts subject to wear are easily accessible.
Strong herringbone pinion gear is precision cut and continuously lubricated to insure long life.
Fully stress-relieved frame provides rigid support for rotating members.
Air ventilating feature insures safe, uniform operating temperature . . . prevents overheating of discs and brake.

other DANLY features

*Results of a 1½ year performance test.

- Sound, Clean Welding
- Precision Machining
- Rigid Enclosed Construction
- Stress Relieved Weldments
- Accurate Alignment
- Circulating Filtered Lubrication System

these features give you

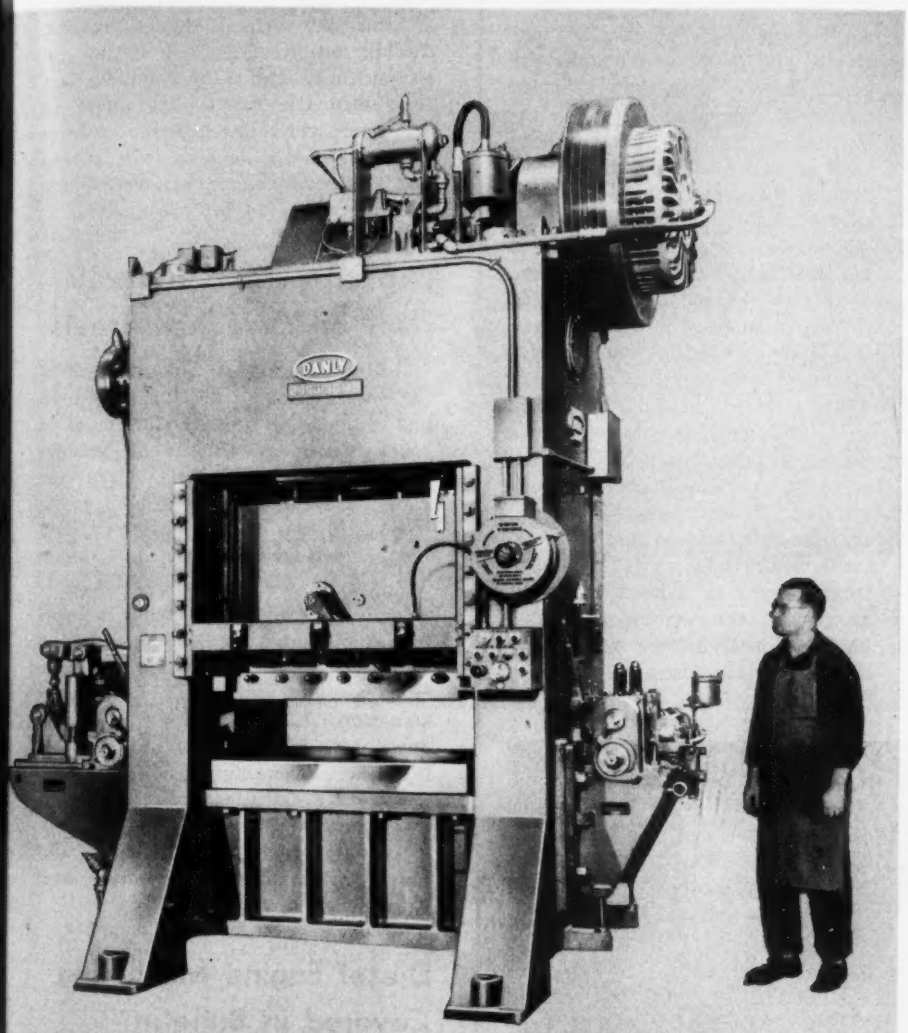
- Safe Operation
- Accurate Stampings
- Less Tool Wear
- Simplified Maintenance
- Ease of Operation
- Accessibility

DANLY

PRECISION DIE SETS...STANDARD AND SPECIAL

REDUCES DOWN-TIME... STEPS UP PRODUCTION EFFICIENCY ON

DANLY PRESSES



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Main Mass of Clutch Rotates with Flywheel to Decrease Clutch Wear

The Danly Clutch and Flywheel Assembly described here is one of the several outstanding engineering features of Danly Presses which are reducing press down-time and stepping up production efficiency.

In designing the clutch and drive shaft assembly, Danly engineers effected a substantial reduction in the load picked up in the clutching operation.

How it is Accomplished

Most of the mass of the clutch is assembled *directly to the flywheel* and rotates with it. The clutch housing is also a ventilating fan which draws off the small amount of heat generated by the clutching action. The *friction discs and their retainer are the only actual clutch members which must be picked up by the flywheel* upon clutch engagement. This mass is approximately 1/7 that of conventional clutch designs. It is this factor which reduces the amount of wear on the clutch and increases production efficiency through less down-time.

engineering service... For assistance in determining the most efficient press for your production call on Danly engineers. Send details about your problems. Without obligation, you will receive specific recommendations.

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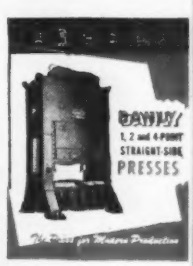


DANLY MACHINE SPECIALTIES, INC.
2100 SOUTH 52ND AVENUE, CHICAGO 50, ILLINOIS

MECHANICAL PRESSES AND PRESS EQUIPMENT

Welding Conductors To Commutator

. . . decreases danger of motor damage caused by overheat

WELDING conductors to commutators in assembling motors for industrial trucks at Elwell-Parker Electric Co., Cleveland, increases their ability to withstand hard usage. This method of manufacture eliminates the melting and displacing of solder used to connect wire conductors to the armature that sometimes results from overheating due to overload.

Melting point of copper is three to four times higher than that of solder and it is also higher than the heat generated in an armature in severe service. So, although more skill, time and cost are required in welding than in soldering, the manufacturer feels that these factors are justified in producing a motor that will give the industrial user longer life.

As many as 65 separate carbon arc welds are made in a 3 to 5 horsepower motor, connecting the tips of the short lengths of wire conductors in the commutator bar necks slots, at both ends of armature coils. Since all wires are insulated up to the points where they are joined after being assembled in the armature, it is necessary to protect this insulation during welding by a water jet that is led in a rubber tube to the parts near the electrode, as shown in the accompanying illustration. In this manner heat is localized and dispersed in the form of steam.

Armature is mounted vertically on its shaft and is rotated by the welder to bring one spot after another before him during the operation. This welding procedure and the use of glass and asbestos insulation in fields as well as armatures results in motors that will absorb all the current a truck's batteries will deliver and eliminates need for fuses.

mix which do not seal the surface of the bore. It is possible, however, that this type of steel might be teemed successfully through a refractory nozzle which had a lower apparent porosity and good spalling resistance.

In the case of the high P.C.E. nozzles there is no effective sealing of the sub-surface layers against fluxing action of FeO and MnO on the surface, and these products can soak into the surface as much as 0.10-inch which lowers the refractoriness of the sub-surface layers and destroys the highly refractory bond between the mullite crystals.

Book Describes Railway Uses of Vanadium Steels

Information about vanadium steels for their efficient use by designers and builders of railway equipment is contained in an illustrated volume published by Vanadium Corp. of America, New York. The book is divided into two parts, a technical and a specifications section.

Technical section covers the various uses of vanadium steels in locomotive construction. Included in this section are: Forgings, castings, springs, plate and diesel engine construction. Latter half of the volume deals with various type of steels alloyed with vanadium and lists such items as: Chemical properties and tests, heat treatment, physical properties and tests, workmanship and finish, marking and inspection and rejection.

Diesel Engine Machining Covered in Bulletin

Case histories of successful, profit making production of diesel engine components with the use of horizontal boring, drilling and milling machines are compiled in a bulletin, "Machining and Repairing Diesel Engines", published by Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. Photographs taken in the plants of diesel engine manufacturers, charts and text make up the bulletin.

Several advanced machining methods are described to illustrate the application of new tooling dies as to the multiple purpose horizontal boring, drilling and milling machine. Examples of the machining methods are: Milling crankshaft bearing seat bores; boring bearing seats simultaneously; cylinder boring time cut from 16 to 4 hours; and practical methods for face milling crankshaft throws.

Sheet Metal Operations

. . . in aircraft supply plant revolve about "air power"

Changing plant needs are supplied by four compressors with varying outputs. Air motors run continuously for long periods without overheating

Fig. 1—Partial view of air compressor room where four single-stage compressors are centrally located to supply plant with air at 100 pounds per square inch pressure

FACTORY costs are inspected as closely as the precision aircraft assemblies made for the country's airplane manufacturers by Rohr Aircraft Corp., Chula Vista, Calif. One of the ways in which this attention to costs shows up is in the plant's application of compressed air.

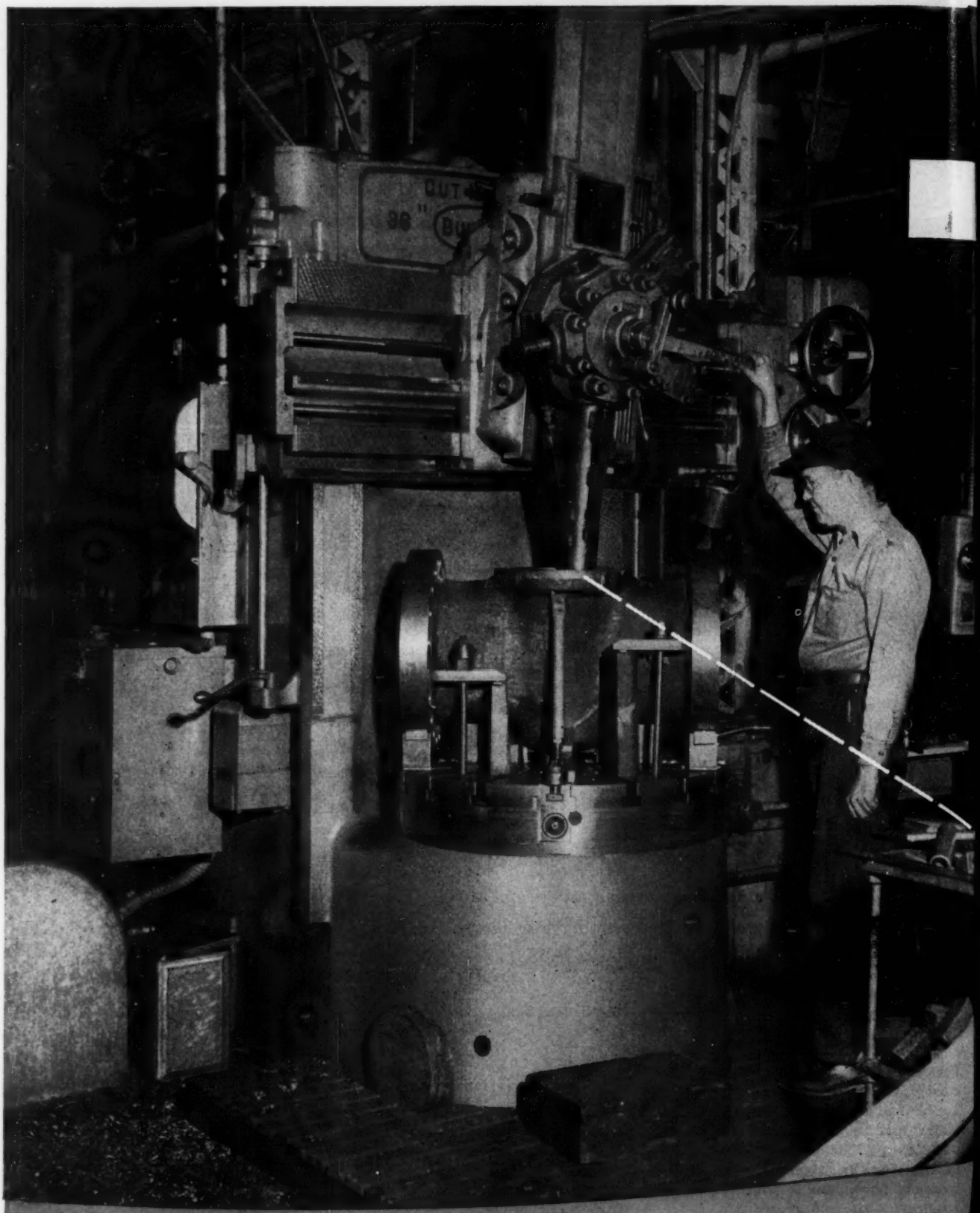
Power for a variety of operations is supplied by four air compressors which are of varying capacities to meet changing plant requirements in most efficient manner. Several combinations are available depending on the number of air-powered tools being used at a particular time. Requirements vary considerably during Sunday shifts, night and full-day shifts, especially when air-consuming sandblasting equipment is in use.

All compressors are of single stage, horizontal reciprocating type, Fig. 1, operating at 100 pounds per square inch pressure. One unit is of 628 cubic feet per minute capacity, two others are 426 cubic feet per minute each and the fourth has a capacity of 380 cubic feet per minute. These provide the plant with a safe margin of capacity, including standby, and permit alternating operation which is an important factor in prolonging life of equipment.

Operations at the company are those of a large sheet metal working plant. The company specializes in aircraft assemblies and power plant installations, taking the bare engine and adding thousands of parts and fittings to make it ready for installation in a plane.

High Speed Drilling — Drilling thousands of rivet holes in aluminum and stainless steel parts calls for high speed apparatus. Air driven motors, Fig. 2, which have been developed by pneumatic tool manufacturers are ideally suited for the work. Air operated rivet guns and squeezers requiring no special system, including a return line, are used for riveting operations.

Large part of the production drilling and riveting is done with special



This BULLARD 36" Cut Master is "really paying off" at Newport News Shipbuilding & Drydock Company. Here you see it taper boring a large valve. On this job, it also faces the flange and counter bores, as shown on the cross-sectional drawing. The Cut Master **not only** saved 33⅓% on these three operations **but also** provided such a smooth finish that a grinding operation was eliminated.

BULLARD CREATES

PERFORMANCE REPORT FROM NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

CUTS COSTS 2 WAYS ON CAST STEEL VALVES with a 36" BULLARD Cut Master

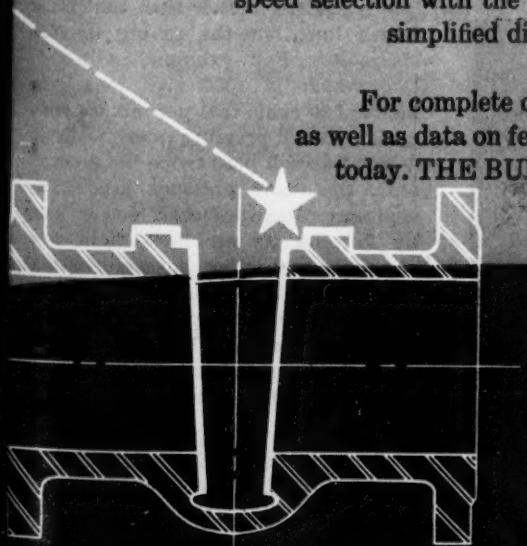
1. SAVED 33⅓% ON 3 OPERATIONS

2. ELIMINATED A GRINDING OPERATION

You, too, can expect savings on most of your jobs. Overall mass weight and rigidity combined with simultaneous cutting of two or three heads, rapid change of speeds and feeds, smooth delivery of power at the point of cutting permit Cut Master V. T. L.'s to take full advantage of the latest in cutting tools. It's easy to see why: The bed is cast in one heavy, rigid piece. Spindle is firmly supported top and bottom by large Timken roller bearings. Screw feeds provide and maintain a high degree of machining accuracy.

OTHER COST-CUTTING ADVANTAGES

Because the BULLARD Cut Master was designed specifically to save time on and between cuts, you find other unique features. The rapid and positive speed selection with the BULLARD pendant type control, limit-stops for simplified dimensional duplication, and centralized operating controls speed up operations and conserve costs. For complete description of these and other distinctive features, as well as data on feeds, speeds and sizes, write for Bulletin CVTL-4-1 today. THE BULLARD COMPANY, Bridgeport 2, Connecticut.



BULLARD

NEW METHODS TO MAKE MACHINES DO MORE

jigs, so the light weight of air-operated tools in relation to their power is not a factor to consider as it would be were the tools held by hand. It is an important consideration, however, that many of the air motors are applied to continuous operation, running constantly up to ¾-hour in some cases. Motors serve without overheating and with the minimum of maintenance.

Large as the drilling and riveting operations are, discussion of compressed air applications in the plant should not be confined to these activities alone. Air wrenches, planishing hammers, air-expanded mandrels and other air-operated equipment also are used.

Air Cushion—An example of compressed air at work is found on the recently installed, 750-ton mechanical press. Largest of its kind on the Pacific coast, this press employs compressed air both for counterbalancing and cushion. One die used with the press might weigh 3000 pounds, another 5000 pounds. A turn of the knob adjusts air pressure for the air cylinder which instantly provides exact counterbalance desired.

Nature of the work requires a cushion for the press, to hold the platen against the press bed. By using air cylinders for the cushion, the pressure remains even from beginning of the stroke to completion, and there is no danger of coining the metal in event its thickness happens to be slightly more than specified.

Chemical Agitator — Compressed air is also used for agitating chemicals employed for etching pickling or other operations. An air line is introduced into the bottom of tank containing chemicals and air escaping through perforations in the pipe does the job, Fig. 3.

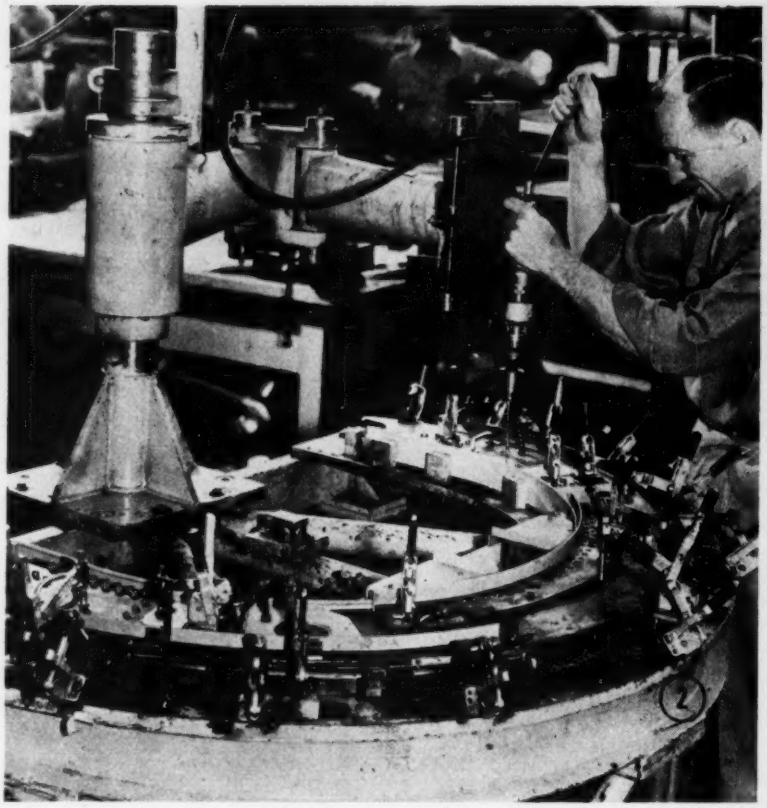


Fig. 2—Bomber part is held in jig for high speed drilling of many holes

Welded and other parts are tested for leaks or porosity by compressed air since in some cases the air test will reveal flaws which other methods of inspection will not. Whether the test is made by soaping or immersing the part in water, the compressed air test is simple and positive.

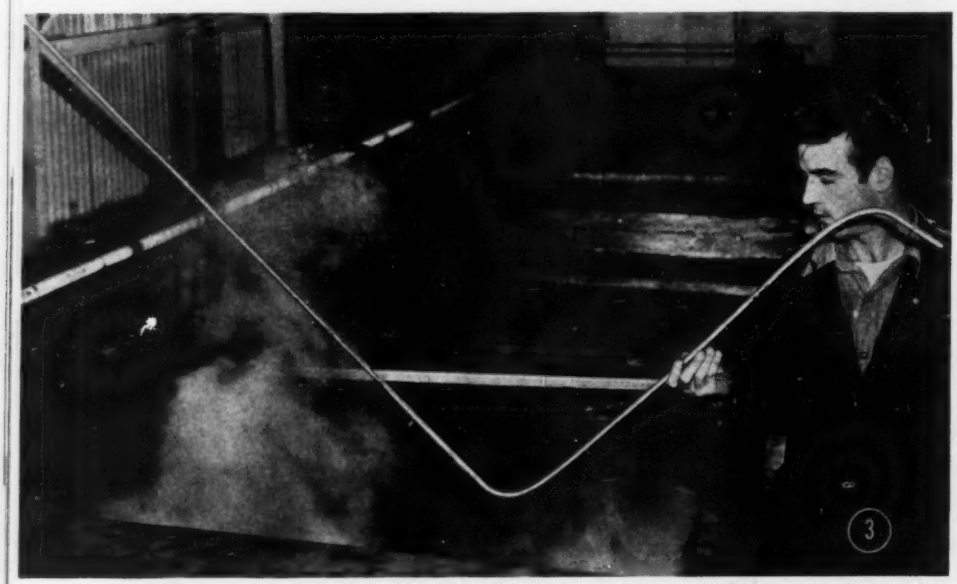


Fig. 3—Perforated air line which fits into bottom of tank is used to agitate chemicals for etching, pickling and other operations

Distribution Line—Distribution of compressed air for the described applications and many others is by means of an overhead 4-inch line which runs down the length of the entire plant. Smaller lines lead off from the main line at every other truss, reducing in size as they reach the tool. Both main and leadoff lines are sloped so that accumulated moisture will flow back into traps.

Cost for installing a 4-inch main line is slightly higher than that for a 3-inch line, but the saving is considerable. For example, a 3-inch line which is 1000 feet long will handle 500 cubic feet per minute with a 2.5 pound pressure loss, while a 4-inch line will pass twice the amount with the same pressure loss. The company also prevents power loss by keeping its air lines tight and regularly inspecting hoses for leaks. Just one 1/16-inch hole would waste 182,000 cubic feet of air a month. While the resultant loss is not large, approximately $9, several such leaks would amount to a considerable item.

—o—

Steel access doors in 33 different styles and sizes are being produced by Inland Steel Products Co., Milwaukee, which come ready to install and furnished with a prime coat of aluminum. Doors are 14 gage steel and housings are 16 gage steel in either hinged or clip fastened types.

Ohio Rolls
SHAPING METAL FOR ALL INDUSTRY
HE-MAN STUFF
There is truth in the saying: "Don't send a boy to do a man's job." That's also good logic and sound economics in steel rolling. To do that man's-size job, to do it well, to keep at it longer without refinishing, is routine with OHIO ROLLS.
Select from any of these eleven types of Ohio Steel and Iron Rolls: Carbon Steel Rolls, Ohioloy Rolls, Ohioloy "K" Rolls, HOLL-O-CAST Rolls, Chilled Iron Rolls, Alloy Chilled Iron Rolls, Denso Iron Rolls, Nickel Grain Rolls, Special Iron Rolls, Nicoloy Rolls, Flintuff Rolls.
THE OHIO STEEL FOUNDRY COMPANY
LIMA, OHIO — Plants at Lima and Springfield, Ohio

12 Cr

OIL MAN'S *Magic Number* TO LICK CORROSION

. . . perhaps YOU have one, too!

DOWN in the oil fields, corrosion was playing havoc in gas condensate, high pressure wells. Equipment replacements were often needed at 30 to 40 day intervals.

Lebanon metallurgists and engineers made a searching analysis after which they came up with Circle Ⓛ 12—a 12% Chromium Alloy. It brought good news to oil men because equipment life was extended appreciably. In some instances, examination disclosed no corrosion after more than a year.

The physical properties of Circle Ⓛ 12 comply with the specifications of the American Petroleum Institute. It likewise meets ASTM specifications A-296-48 Grade 10.

What we have done for the oil industry, we can also do for you. Tell us your particular corrosion troubles. Perhaps one of the new Circle Ⓛ Alloys will be your answer to longer equipment life.

LEBANON CIRCLE Ⓛ 12

NOMINAL PHYSICAL PROPERTIES

API—Normalized and Drawn

Tensile Strength	90,000
Yield Point	65,000
Elongation in 2"	18%
Reduction of Area	30%

Oil Quenched and Tempered

Tensile Strength	105,000
Yield Point	90,000
Elongation in 2"	17%
Reduction of Area	35%

LEBANON STEEL FOUNDRY • LEBANON, PA.

"In The Lebanon Valley"

ORIGINAL AMERICAN LICENSEE GEORGE FISCHER (SWISS CHAMOTTE) METHOD

LEBANON *ALLOY AND STEEL* Castings

CIRCLE Ⓛ

Strip Tension

(*Concluded from Page 70*)

ing the steel strip is such that the transmission is set at its maximum speed when the strip is first wound on the core. The winding speed is continuously decreased as the coil fills up. Load of a tension weight on the control belt idler determines the horsepower the control belt will carry. As each layer of steel strip is wound on the core for any given value of tension in the strip, there is a tendency for the load to correspond. The tendency for the load to increase across the control belt, is reflected by rotation of the B shaft of the differential, which in turn rotates in the direction necessary to decrease speed of the transmission.

When the strip is cut, there is no longer a load on the control belt. This upsets the speed relationship between the A and B shafts causing the B shaft to rotate in the opposite direction, thereby resetting the transmission to its maximum speed, so it is again ready for starting the strip on the core again.

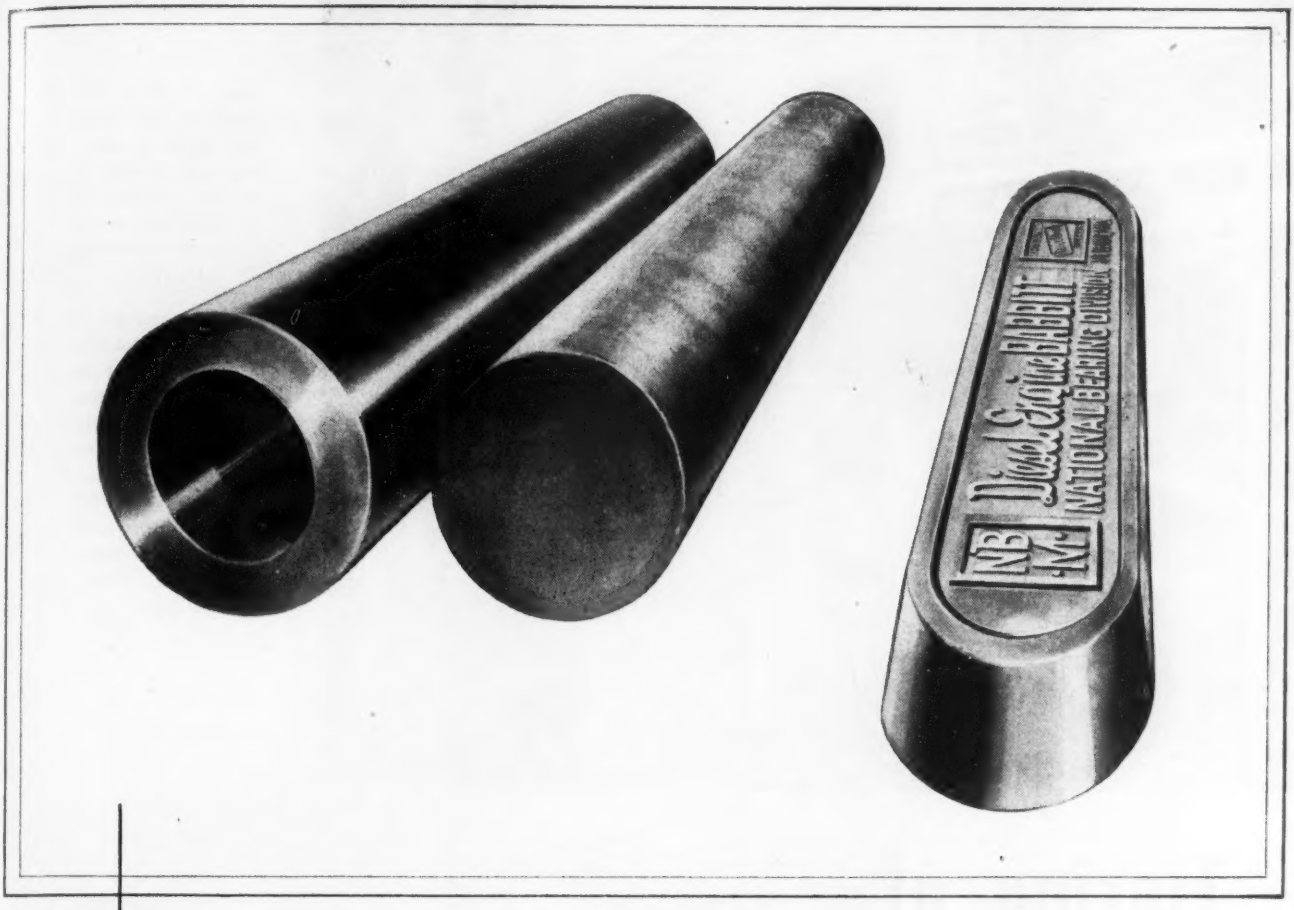
The simple control system accurately maintains a constant tension in the strip, to correspond exactly to the preselective tension of the strip. This is measured by the power-carrying capacity of the control belt and is indicated by the differential in terms of speed difference between the driving and driven end of the control belt.

This system has been in operation for over 2 years and has given excellent performance, both in accurately controlling the tension in the strip and in recoiling the strip in a good package. The entire system has been almost maintenance-free, in spite of the fact that operation has been on the basis of 18 hours, 7 days a week schedule for a good portion of this time.

By far the most important reason for this system's being an answer to the problem, is that the strip is recoiled without any relative movement between the layers of strip on the coil, which gives a very low scrap percentage per pound of final slat strip. This results from having a perfect surface on both sides of the strip as prepared throughout the system, and from being able to wind it so there is no slip mark on the surface after it is recoiled.

—o—

Aeronautical material specifications including 42 new specifications and 20 revisions as of May 1, 1948 are now being issued by Society of Automotive Engineers Inc., New York.



Custom-Alloyed or Standard Bearing Metals

National Bearing Division offers a complete line of bearing metals— or any type of non-ferrous alloy to required specifications

N-B-M Babbitt Metals have gained nationwide recognition for these important reasons: virgin metals are used exclusively . . . alloys are correctly proportioned . . . blending is controlled. Specify any of the following service-proved babbitts for long range economy and trouble-free service:

"Nickel" Babbitt — **"Diesel Engine" Babbitt**
"Improved" Babbitt — **"Rex" Babbitt**
"Regent" Babbitt — **"Genuine" Babbitt**
"Extra Copper-Hardened" Babbitt

For unequalled performance in heavy duty service, specify "Tiger Bronze". "Tiger Bronze" is specially compounded to give maximum density with minimum friction . . . withstands heavy shock and pounding. Furnished in cored or solid bars, rough or machined.

When your bearings are subjected to unusually severe or heavy duty service, call the nearest National Bearing Division service engineer. Many bearing applications require "custom-alloyed" bearing metals for lining and shells. National Bearing has the unique ability, acquired by 74 years of experience, to give you thorough engineering service on problems of design, stress loading, alloy and lubrication.

For fewer shutdowns and lower maintenance costs, let National Bearing's unique service take over your bearing problems.

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AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION
ST. LOUIS • NEW YORK

PLANTS IN: ST. LOUIS, MO. • MEADVILLE, PA. • NILES, OHIO • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

Fig. 1 (left) — Shelves for storage of large castings are made of angles spaced at a width equal to distance between skid legs

Fig. 2 (below)— Outside storage of crankshafts in locking type bins makes possible stacking in tiers without danger of toppling. All photos courtesy Yale & Towne Mfg. Co., Philadelphia

Tiering of Materials

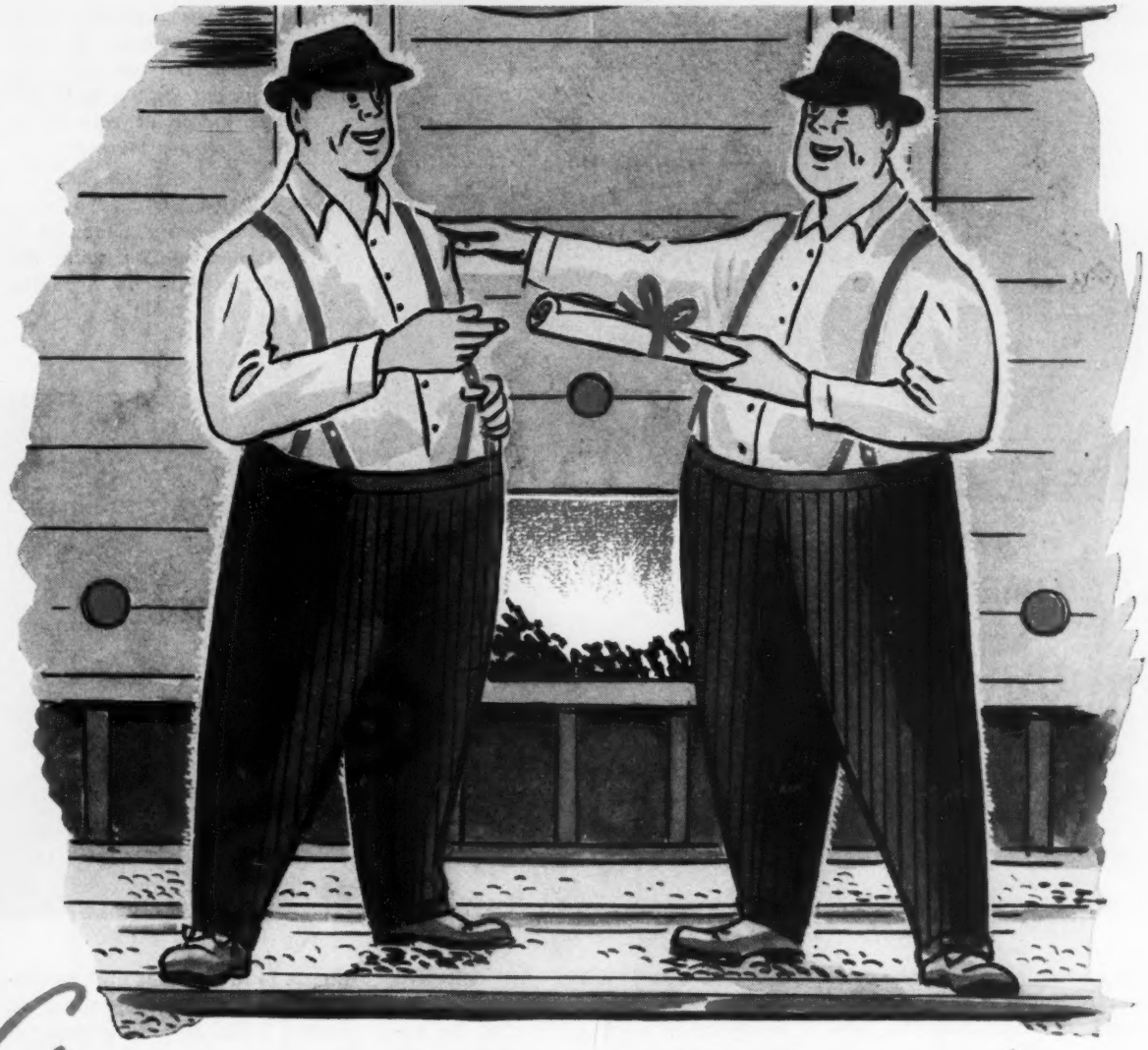
Conserves Valuable Floor Space

MANY metalworking companies have awakened to the economies of overhead storage, both in temporary and long time warehousing operations, as a result of the impetus given to handling techniques by the war, and the added value given to space by high building costs. In order for any company to get the most benefit from changes in its system of storage, it is necessary to make a thorough study of the handling system now in use, and bringing about changes on an overall rather than a piecemeal basis.

Racks of simple angle iron construction, as shown in Fig. 1, are used by one manufacturer to store heavy castings. Second and third shelves are not solid members but are constructed of angles which have been spaced at a width equal to distance between skid legs. Another manufacturer tiered metal reinforced skid bins three deep to make use of available head room by placing boards across tops of lower bins to form a base for succeeding tiers. By arranging bins diagonally to aisles, lift trucks can approach bins at an obtuse angle permitting use of narrower aisles and adding to floor space.

Bins having no front or back allow odd shaped crankshafts to protrude over the edges, as shown in Fig. 2. Angle iron members secured to ends of bins interlock with similar members of succeeding bins, thus forming a locking arrangement and eliminating danger of toppling. In still another instance, seventy aluminum castings are loaded on a pallet, fourteen to a layer and five layers high. To keep the load solid, smooth and resistant to vibration during transit, strip is run lengthwise and abreast to bind layers to pallets. Fork trucks are then used for stacking pallets to ceiling height.

These materials handling techniques reflect in actual savings in cost of handling materials and facilitates taking of inventories. Also, tiering requires that storage and warehousing locations are kept in a neater and more orderly condition than in most cases where goods are stored on floor only.



Give yourself a diploma!

IF you're an open hearth or electric furnace superintendent, and you've had the good judgment and foresight to protect your furnace bottoms with Baker's Magdolite . . . then it's high time you gave yourself a diploma! Your improved furnace practice has increased production through additional yield, reduced fuel costs, insured uniform ingots and less defective production material. You're worth a gold star on your company's report card. Keep up the good work!

Baker's MAGDOLITE, the Original Dead-Burned Dolomite, has the superior chemical, physical and mineralogical composition needed for greatest protection and economy. Properly burned grain size particles for open hearth and electric furnaces.

MAGDOLITE!

THE J. E. BAKER COMPANY

BILLMEYER, PA. YORK, PENNSYLVANIA MILLERSVILLE, OHIO

Magdolite • Low Silica Limestone • Chemical Lime • Fluxing Lime

5 ways better
COMPOSITION
QUALITY
STRENGTH
PREPARATION
ECONOMY

You're always SAFE with BAKER'S MAGDOLITE

Fig. 1 (left)—Milling a ¾ x ⅜-inch keyway in cold rolled shafting in one continuous cut with a ½-horsepower motor at rate of 1-inch per minute

Fig. 2 (below)—Rotary grinding being done on a horizontal miller with the work mounted on a rotary table

MACHINE TOOLS

Gain Versatility

...with auxiliary power unit

DIVERSE machining operations such as milling, reaming, boring, drilling, routing and grinding may be performed with a unit now being manufactured by Versa-Mil Co., New York. It is adapted for mounting on 12 to 36-inch lathes and will substitute for other more expensive machine tools or balance out the shop load by supplementing overloaded tools.

With other machine tools such as planers, boring mills, horizontal millers and turret lathes, the unit will eliminate handling time and simplify setup since work piece may be retained in a single machine for a series of operations. For example, large castings mounted on a planer may be planed and then milled, drilled and ground without moving work from planer bed.

In its simplest form, the basic unit is equipped with either a ½ or ¾-horsepower motor with spindle speeds from 33 to 295 revolutions per minute. It is 16½-inches high and weighs 89 to 104 pounds depending on the motor. With a ½-horsepower motor it will mill a ¾ x ⅜-inch slot in steel at a rate exceeding 1-inch per minute, Fig. 1.

Grinding heads equip the unit for cylindrical, surface and internal grinding and for tool grinding as shown in Fig. 2. Grinder speeds range from 4140 to 13,800 revolutions per minute with capacities from 1 to 6-inch diameter wheels.

Work Positioning Table Cuts Assembly Time

Hydraulic elevating tables made by Lyon-Raymond Corp., Greene, N. Y., are used by a manufacturer of telephone switchboards in order to avoid bending and reaching during wiring operations. Work can be adjusted to a convenient working height at all times by means of a hydraulic foot pump. Use of the table cuts assembly time and reduces worker fatigue, improving job efficiency sufficiently to justify cost of the table.

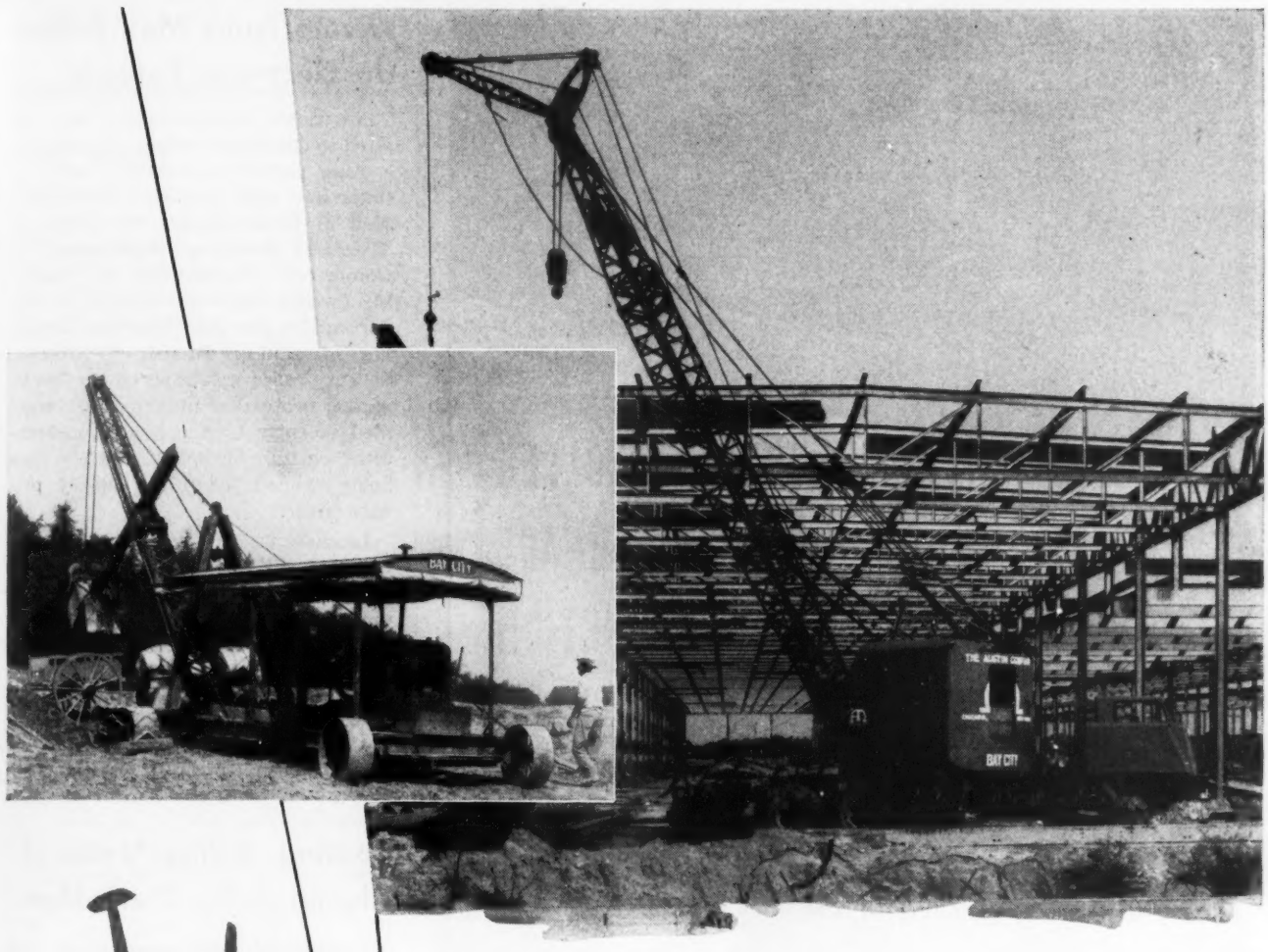
Platform has a capacity of 500 pounds and elevates from a lowered height of 4 inches to an elevated height of 30 inches, allowing all work to be done from a sitting position.

Multiuse Bricks Have More Heating Surfaces

Designed to increase the heating surface in hot blast stoves, a new checker brick permits the design of an improved basket weave checker system. According to Jay J. Seaver Engineers, Chicago, the checker brick has been found equally applicable to installation in open hearths, soaking pits, glass furnaces and water gas sets where increased surfaces are desirable to provide greater heating areas and increased productive capacity.

Rectangular in shape, with the upper corners beveled off and a hole through the middle for additional heating surface and equalized heating and pressure over the entire area and lancing openings, the brick is made in stable shapes with the center of gravity below the middle. When laid in a standard basket weave pattern, its cut-away sections lock each brick at top and bottom with other bricks, reportedly making it impossible to move in any direction.

Heating surfaces are increased 30 per cent, it is said, and 90 per cent of the volume is exposed. Equalized heat and air over the entire checker area is given, together with turbulence and high heat exchange.



Judge Twin Disc by the Companies it keeps

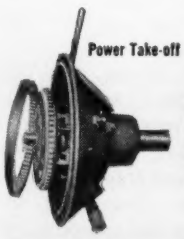
(Left) This one-man excavator, built around 1923, is similar to the first Bay City machine equipped with a Twin Disc Clutch. Bay City Shovels, Inc., since has used Twin Disc Clutches exclusively on excavating and material-handling equipment.

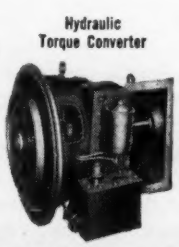
(Right) Bay City's current Model 180-T66 CraneMobile, Twin-Disc equipped, works for the Austin Company on a plant construction job near Kalamazoo, Mich.

Bay City Shovels, Inc., uses Twin Disc Clutches exclusively on its excavating and material-handling equipment.

Bay City used its first Twin Disc Clutch in 1923.

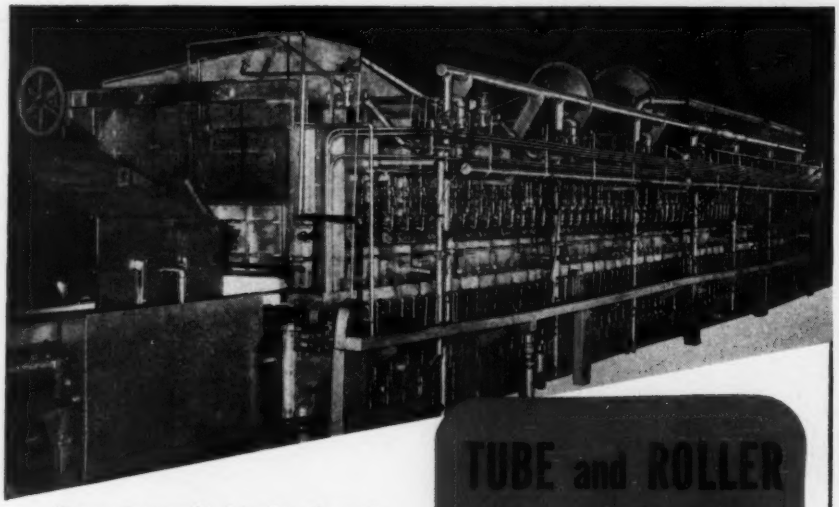
97 leading manufacturers of material-handling and earth-moving equipment find Twin Disc Friction Clutches and Hydraulic Drives efficient units for power transmission. You can judge Twin Disc by the companies it keeps. TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois.)





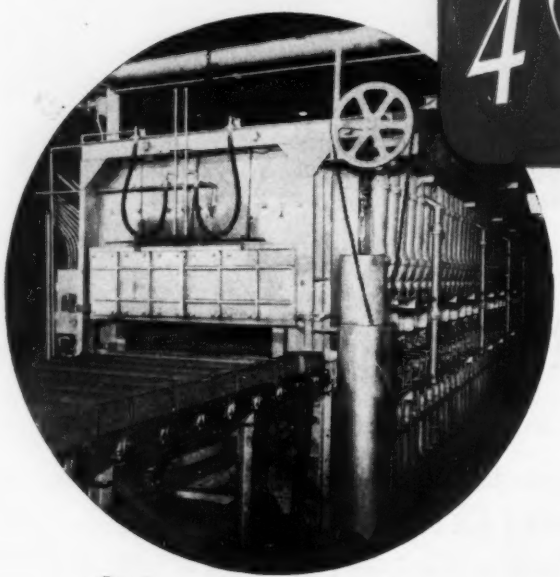
TWIN DISC
CLUTCHES AND HYDRAULIC DRIVES
REG. U.S. PAT. OFF.

SPECIALISTS IN INDUSTRIAL CLUTCHES SINCE 1918



Recently installed in the plant of a large steel producer, this 5'6"x70' annealing furnace is used to anneal stainless steel sheets. It is equipped with *CARBOFRAX radiant tubes and rollers. (*CARBOFRAX is a registered trade-mark indicating manufacture by the Carborundum Company.)

TUBE and ROLLER HEARTH FURNACE UPS PRODUCTION 4 Ways



The improved design of this new GASMACO furnace has resulted in these production economies to the user: (1) manpower requirements reduced by 60% (2) stainless steel sheets are uniformly annealed within 2 points of hardness—surface finish is free of defects (3) pickeling time reduced to 20% (4) polishing time reduced 50%.

These production economies reflect GASMACO's 45 years' experience in industrial furnace engineering and manufacture—experience available to you on your next heat-treating job.

THE GAS MACHINERY COMPANY

16116 WATERLOO ROAD
CLEVELAND 10, OHIO

Designers •Fabricators •Erectors
Gas Plant Equipment and
Industrial Furnaces

Private Firms May Follow Up Electronic Patents

American manufacturers are invited to contribute to the cost of prosecuting patent applications covering radar and high frequency electronics filed in Great Britain by Office of Technical Services, Department of Commerce, Washington, for possible foreign trade advantages or opportunities for the reciprocal licensing of similar British discoveries. Seventy cases appearing on the fourth patent protection program list were filed recently by the federal government on its own behalf and are now being opened for follow up by private firms.

Licenses under any foreign patents received will be available to American nationals on a royalty free, nonexclusive basis. In order to aid in furnishing interested manufacturers with information on the British filed inventions, special provisions have been made for examination of all foreign patent applications involved at the commerce building.

Roofing, Siding Made of Aluminum for Plant Use

Corrugated aluminum sheet for use as roofing and siding on industrial buildings was developed recently by Reynolds Metals Co., Louisville, with a corrugation depth of 7/8-inch and a pitch of 2.666 inches. The lightweight material weighs only 56 pounds per 100 square feet and is manufactured in several sheet sizes.

New roofing material which can be applied directly over the purlins has sufficient strength to support workers who must walk on it while it is being installed or at any other time. As siding, material is made in a width of 33-3/4 inches and in lengths ranging from 5 to 12 feet in multiples of 1 foot. Sheets for roofing are 35 inches wide and in same range of lengths as siding. A complete line of accessories for use with the aluminum sheeting are also being produced.

—o—

Single cylinder pump for high speed diesel engines in the 5-15 horsepower range was announced recently by Ex-Cell-O Corp., Detroit. It is said to be suitable for 1 and 2-cylinder engines. Combined with the nozzle made by the company, the pump makes a reliable injection system that can be used for small engines.

New Products and Equipment

Bench Grinder

Powered by a ¼-horsepower, ball bearing, constant speed induction motor, the No. 266 bench grinder, announced by Stanley Electric Tools, New Britain, Conn., is suitable for light grinding, sharpening tools, buffing, polishing and wire brush work. Operating on 60 cycle current, its speed is 3450 revolutions per minute.

Features include full ball bearing action, bearings enclosed against dirt and grit, safety type wide wheel guards, adjustable tool rests, toggle type switch enclosed in a molded case located in the grinder base. Guards are adjustable to permit grinding at any point on the wheel circumference. Machine is furnished with two wheels measuring 6 x 2 inches, one coarse and one fine.

Check No. 1 on Reply Card for more Details

Fatigue Tester

Full sized machine and structural parts or assemblies may be loaded and tested under simulated service conditions with the new universal fatigue testing machine, built by Baldwin Locomotive Works, Philadelphia 42, Pa. Line of machines has a stroke variable from 0 to 8 inches. Loads up to 10,000 pounds can be applied directly in tension and compression and with simple fixtures torsional fatigue loading can be applied.

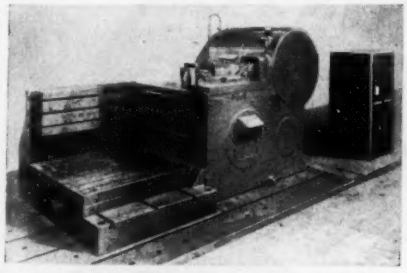
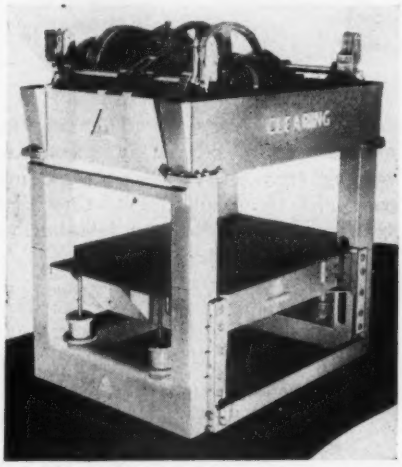


Photo shows model BF-10-U machine of constant force stroking type. It is a crank stroking type in which stroke is adjusted by a planetary gear system with an independent motor that maintains constant load by varying automatically the distance of a spindle from the center of rotation. Parts and assemblies up to about 5 x 5 x 5 feet can be subjected to fatigue loading in this machine. Automatic equipment for controlling indicating load and recording changes in stroke are contained in a separate cabinet.

Check No. 2 on Reply Card for more Details

Welding Press

Large, complicated sections may be handled swiftly and efficiently with the spot welding press developed by Clearing Machine Corp., Chicago, Ill. Several welds can be done at the same time. Actuated by a toggle link mechanism, an upmoving platen with four-point suspension brings the work to the electrodes. Welding operation is automatically controlled from a special panel.



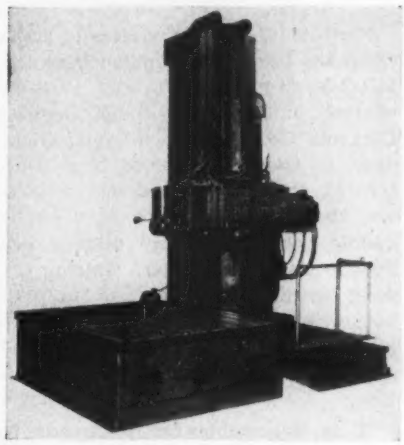
Each time press reaches top of the stroke, a contact on this control panel energizes the automatic welding panel, causing the actual welding process to be performed in the required sequence. At the end of the welding operation, the platen returns to its open position. Four adjusting brackets keep platen and bed parallel. The single geared V-belt drive with air friction clutch is on top.

Check No. 3 on Reply Card for more Details

Milling Machine

Cincinnati Gilbert Machine Tool Co., 3366 Beekman St., Cincinnati 23, O., is building an electro-hydraulically operated floor type milling machine for punch press frames which uses carbide milling cutters in all operations. It machines bolster seat, slides, gib pads and crankshaft cap seat of a 60T O.B.I. frame in one setting. Machine consists of a heavy column and runway, spindle head slide, spindle carrier head and fixed table.

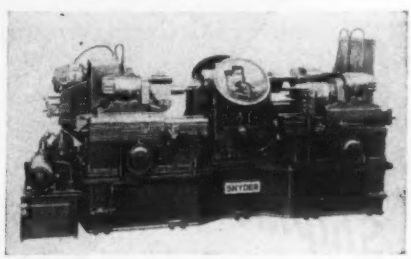
Milling feeds and rapid traverse are by hydraulic power. Saddle has a sliding vertical motion on the column by hydraulic power providing milling feeds and rapid traverse. The spindle slide contains the spindle drive motor and gearing for speed changes. It has a sliding motion on its saddle by hydraulic power. Spindle carrier head contains a tapered bearing spindle with a No. 50 standard taper in one end a No. 40 standard in the opposite end. Heat can be swiveled 45 and 90 degrees. Hydraulic system consists of a 3 horsepower power pack, providing continuously variable feeds ranging from 1 to 15 inches per minute and power traverse of 90 inches per minute.



Check No. 4 on Reply Card for more Details

Drilling Machine

Cross slide holes in 70 different sizes and types of clutch housings may be drilled and line bored with the machine designed and built by Snyder Tool & Engineering Co., East Lafayette, Detroit, Mich. A work piece is manually clamped in each of two stations on a manually rotated index table mounted centrally between the slides. Fixtures are provided with vertical slide in and out adjustment.



Four hydraulically actuated Snyder standard slide units are mounted horizontally and opposed in pairs, front and rear. The two rear slides

are equipped with single spindle drill heads and are used to drill the cross shaft holes. The two front slides have Parker boring spindles for finish line boring the holes. Front spindles have micrometer adjustment for setting of tungsten carbide finish boring tools. Spindles are driven by a Reliance V-S drive which permits spindle revolutions to be changed to suit the size of tools being used.

Check No. 5 on Reply Card for more Details

Safety Gas Controls

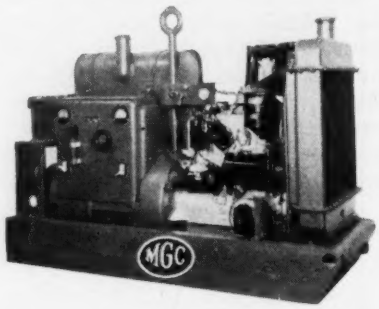
Flow of all gas automatically stops when the pilot is extinguished on the MR-2-5 on-off and safety shut-off control unit developed by General Controls Co., 801 Allen Ave., Glendale 1, Calif. Designed for floor, central, small space and water heaters, the unit can be set by a single handle control for any desired gas flow to the main burner. During the reset operation, gas flows to the pilot burner only. No gas can pass to main burner until pilot is ignited and safety valve set in operating position.

It is impossible for pilot gas to remain on should the operator leave the handle in the off or reset position without pilot ignition being established. Safety valve operating mechanism is protected against air-borne or gas-borne foreign matter. Accessible thermocouple terminals permit check of couple or valve operation under normal operating conditions without breaking connections.

Check No. 6 on Reply Card for more Details

Magnet Generators

A line of gasoline engine driven generators to supply power for handling scrap or pig iron with magnet cranes is announced by Motor Gen-



erator Corp., Troy, O. The magnet generators are offered in six sizes, ranging from 5 to 25 kilowatts. Compact and light in weight, they are without canopies for easy installation in the crane's cab.

Standard equipment includes a commercial automotive type gasoline engine, but diesel engines are available. They are connected directly to and on a common structural steel base and are drip proof, ball bearing mounted, self-ventilated and rated for continuous duty. All models have 6-volt battery ignition, pushbutton starter, radiator, fuel tank and are assembled ready for service.

Check No. 7 on Reply Card for more Details

Melting Furnaces

Stroman Furnace & Engineering Co., Franklin Park, Ill., is manufacturing a line of furnaces ranging from 400 to 20,000 pounds brass or equivalent holding capacity. Furnaces are of the tilting reverberatory type for firing with gas, oil or combination burners and for powdered coal or petroleum coke in the larger sizes. A preheat hopper in the flue or vent gives added fuel economy.

After the furnace is preheated, a charge of brass is ready for pouring in 20 to 25 minutes for all sizes up to 1200 pounds. As cold metal does not reach the molten bath, remaining in the hopper until molten, the time required before pouring is

A Complete Warehouse Service for...
SHEETS • PLATES
STRIP • STAINLESS STEEL
TIN PLATE • BARS • SHAPES
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WORLD-WIDE EXPORTERS • NEW YORK • CLEVELAND • SAN FRANCISCO
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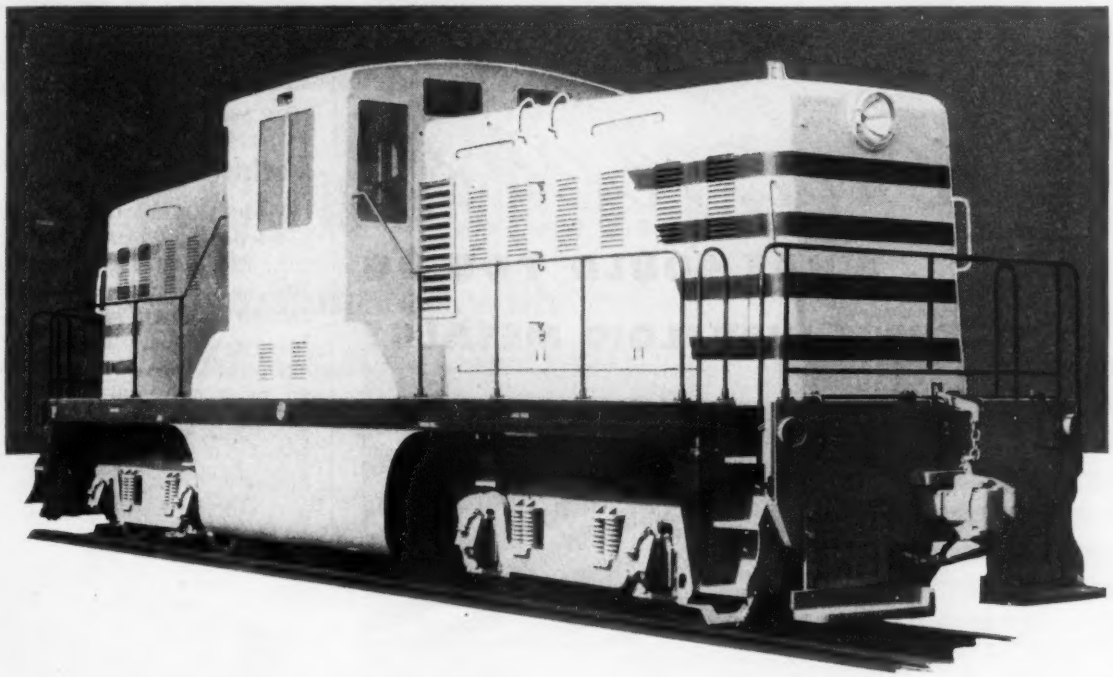


WHITCOMB LOCOMOTIVES WERE GOOD YESTERDAY
THEY ARE BETTER TODAY
AND THEY WILL BE FURTHER IMPROVED TOMORROW

Whitcomb has been designing and building Diesel mechanical and Diesel electric industrial type locomotives for many years. As requirements vary, as new metals are introduced, as improvements in design suggest themselves. Whitcomb customers receive these advantages in locomotives that will move *more tons* in *less time* at *lower costs* per mile.

Whitcomb designers and engineers are not content to rest on their laurels—they produce a superior product today but their chief competition is with themselves. Their constant efforts to better their own work guarantees the continued high quality of every locomotive that leaves the Whitcomb plant. Whatever your switching and haulage problem may be, there is a Whitcomb locomotive designed to solve it—at a saving too.

Diesel Mechanical—Diesel Electric Locomotives from 3 to 95 tons.

BLW THE BALDWIN GROUP

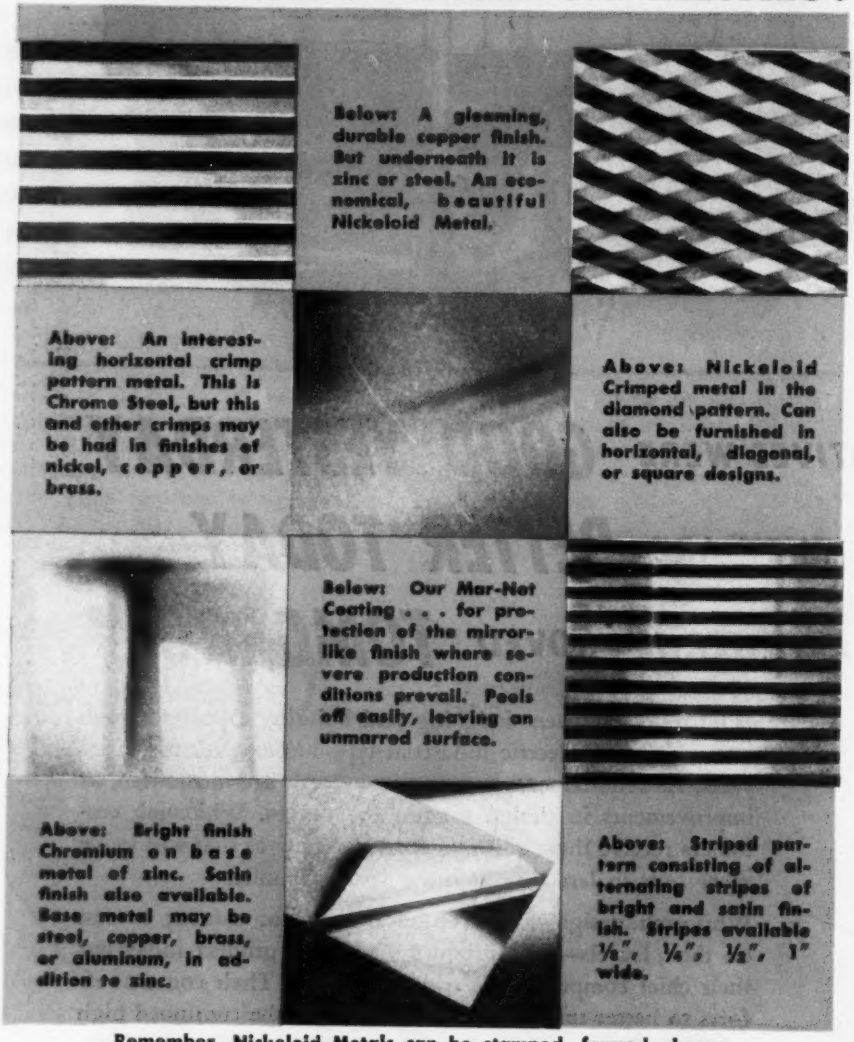
THE WHITCOMB LOCOMOTIVE CO.

ROCHELLE, ILL.

Subsidiary of THE BALDWIN LOCOMOTIVE WORKS

Designers:

WHAT COULD YOU DO WITH THESE NICKELOID METALS?



Below: A gleaming, durable copper finish. But underneath it is zinc or steel. An economical, beautiful Nickeloid Metal.

Above: An interesting horizontal crimp pattern metal. This is Chrome Steel, but this and other crimps may be had in finishes of nickel, copper, or brass.

Above: Nickeloid Crimped metal in the diamond pattern. Can also be furnished in horizontal, diagonal, or square designs.

Below: Our Mar-Not Coating . . . for protection of the mirror-like finish where severe production conditions prevail. Peels off easily, leaving an unmarred surface.

Above: Bright finish Chromium on base metal of zinc. Satin finish also available. Base metal may be steel, copper, brass, or aluminum, in addition to zinc.

Above: Striped pattern consisting of alternating stripes of bright and satin finish. Stripes available ⅛", ¼", ½", 1" wide.

Remember, Nickeloid Metals can be stamped, formed, drawn without harming their mirror-like finishes. Available in sheets, coils . . . wide range of sizes, gauges, and tempers.

50 Years of Pre-plated Metal Leadership

NICKELOID METALS (Pre-Plated)

NICKEL · CHROMIUM · BRASS · COPPER · ZINC
Electro-plated TO ALL COMMON Base METALS
ALSO LACQUERED COLORS
SHEETS AND COILS

OLDEST AND LARGEST PRODUCERS OF PRE-PLATED METALS

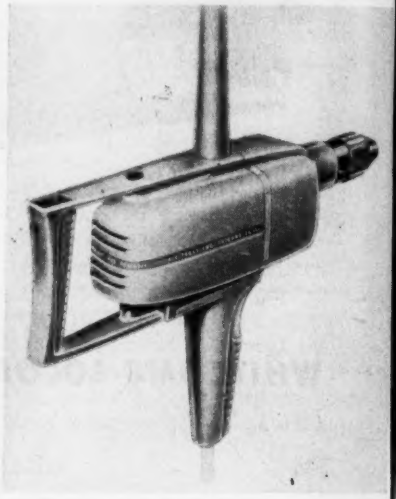
AMERICAN NICKELOID COMPANY
Established 1898
PERU 1, ILLINOIS

reduced. Aluminum capacities are approximately 40 per cent of brass ratings and iron 75 per cent. Smaller furnaces are tilted by compressed air, the larger by hydraulic pressure.

Check No. 8 on Reply Card for more Details

Electric Drill

Model 500 portable electric drill, developed by Portable Electric Tools Inc., 225 West 79th St., Chicago 20, Ill., has a balanced armature for smooth running and a blower type fan for cooling. The streamline design drill has ½-inch capacity, is driven by a universal alternating-direct



current motor and is equipped with removable side handle for close-quarter drilling.

No load speed is 400 revolutions per minute and full load speed is 240 revolutions per minute. Capacities are as follows: Steel, ½-inch; hard wood, 1 inch; hole saws, up to 2½ inches. Drill has oil retaining bronze bearings with ball thrust bearing on chuck spindle. Heat treated steel gears are in a grease-tight compartment.

Check No. 9 on Reply Card for more Details

Selector Valves

Alternating current, solenoid operated 4-way selector valves designed for service with water, oil or air at operating pressures to 250 pounds per square inch are currently being manufactured by Saval Inc., 1915 East 51st St., Los Angeles 11, Calif. The series includes pipe sizes of ¼, ⅜, ½, ¾ and 1 inch. Valves may be converted for direct current operation by changing solenoids.

Some of the features of the No. 8900 series are: Leak proof design, only one moving part, direct operation and ease of installation. Constant metal to metal contact of sealing members in the valve wipes away foreign material, thus valve is not

Machine Tools...

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Cost Less to Make— and to Use

THE BUILDER SAVES . . . because straight-driving, easy-handling American Phillips Screws cut assembly time as much as 50%. What's more, these modern, *engineered* screws banish burrs, outlaw scarred work-surfaces—and give a precision machine the final outward mark of inward quality.

. . . AND THE BUYER SAVES, TOO . . . because every screw has been turned up flush, to utmost tightness . . . thereby minimizing vibration, and all the other headaches that follow when you get "a screw loose." And there are no burred heads to snag clothes, slash hands, cause accidents, lose time. Couldn't *you* use these advantages *and savings,* in your own product? Write.

AMERICAN SCREW COMPANY, PROVIDENCE 1, RHODE ISLAND

Chicago 11: **589 E. Illinois St.** *Detroit 2:* **502 Stephenson Building**

4-WINGED DRIVER CAN'T SLIP OUT OF PHILLIPS TAPERED RECESS

AMERICAN PHILLIPS *Screws*

ALL TYPES

ALL METALS: Steel, Brass, Bronze, Stainless Steel, Aluminum, Monel, Everdur (silicon bronze)

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- Precleaning in tanks
- Precleaning in machines
- * Alkaline cleaning in tanks
- Alkaline cleaning in machines
- Pickling
- Barrel cleaning
- Electrocleaning
- Pre-paint treatment in tanks
- Pre-paint treatment in machines
- Steam-gun cleaning
- Paint stripping

FOR MORE INFORMATION about these and other processes—burnishing, anti-rusting, controlling water-wash in paint spray booths, cooling and lubricating machining and grinding operations—consult the Oakite Technical Service Representative in your vicinity or write for descriptive literature.

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Technical Service Representatives Located in Principal Cities of United States and Canada

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Specialized Industrial Cleaning
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critical to dirt. Valve is two position spring loaded in normal position and measures 7 13/16 x 5¼ x 3½-inches.

Check No. 10 on Reply Card for more Details

Crane Cab Filter

Lintern Corp., 50 Lincoln Ave., Berea, O., is announcing the Filter-Aire unit for cabs of cranes in industrial plants exposed to waste gases where mechanical refrigeration is not required and where atmospheric conditions are bad. The 60 x

14 x 26-inch unit is placed in the conventional type of cab (after it is enclosed) against the back wall. It is available for either alternating or direct current opeation.

Unit has a mechanical screen filter on the fresh air intake. Air then passes through the electrostatic filter which clears it of smoke and vapors. A bank of 12 activated carbon canisters removed waste gases and fumes. An electric heater maintains a comfortable temperature in the winter. An adjustable damper regulates the amount of outside air taken into the unit.

Check No. 11 on Reply Card for more Details

Dial Comparator

The heavy duty No. 130 dial comparator, developed by B. C. Ames Co., Waltham 54, Mass., is designed to provide a larger size instrument of greater range for the checking of comparatively heavy parts, such as large diameter shafts, solid blocks having large cross sections, etc. Its base is of solid 1-inch thick steel, with top finish-ground to a close-tolerance flatness.

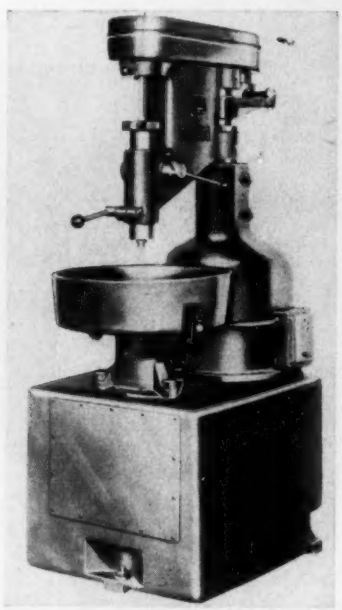
Upright post is of 1¼-inch solid steel, fixed to the base. The 1-inch steel indicator bar has its own clamp, allowing indicator reach and adjustment to be made without changing post clamp's vertical position. Base and upright post may be of any size and height. Indicators of various types, dial graduations, dial readings and ranges are available.

Check No. 12 on Reply Card for more Details

Lapping Machine

Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 4, Mich., is manufacturing a line of Microflat machines for finishing flat surfaces. The series of six models of two types of machines use either bonded or loose abrasives. Machine illustrated will finish flat surfaces regardless of shape or size of part. The other type machine will finish two opposite sides of the parts simultaneously within 0.0001-inch for parallelism.

One or many parts may be processed at the same time. The sur-



faces will be optically flat within one light-band and can be held to a finish of one microinch R.M.S. or less, if desired. Any material from soft copper, to quartz or Nitroalloy, may be finished.

Check No. 13 on Reply Card for more Details

Hydraulic Press

Watson-Stillman Co., Roselle, N. J., is manufacturing a portable hydraulic press of 200 metric tons capacity for forcing locomotive crank-pins, designed to conform to current European railroad shop practice. Capacity of machine is adjustable by a bipass safety valve from a maximum of 200 metric tons. A dial gage, located near the operator, gives direct reading of pressure at all points in the working stroke.

Speed and position of ram is gov-

erned by a lever controlled operating valve. A welded steel reservoir with sight level gage is flush-mounted in the frame. All external piping is protected by reinforcing members of the frame.

Check No. 14 on Reply Card for more Details

Centralized Counter

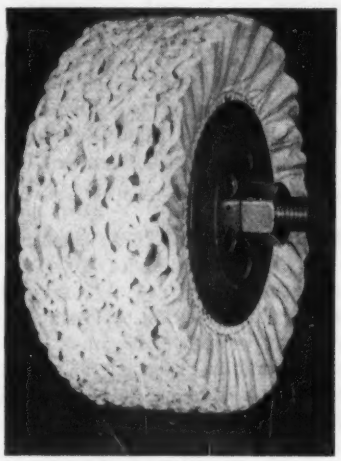
Centralized counting installation developed by Production Instrument Co., 704 West Jackson Blvd., Chicago 6, Ill., consists basically of electric counters grouped in a panel, arranged to register output of various machines, operations, or movement of parts, etc., throughout the plant. Below each counter is a panel equipped with a two-pole, single-throw toggle switch, pilot light and plug-in receptacle. Illustrated is a 50-unit panel.

Toggle switch is used to turn on counter and pilot light when machine is started. The receptacle is used to connect a tape recording device when a permanent record is desired. Panel is built up by assembling Panelmount steel cabinets, each of which provides complete enclosure for five counters. Knockouts for wiring and assembly bolts are provided. Each cabinet measures 5½ x 19½ x 5⅜ inches.

Check No. 15 on Reply Card for more Details

Contact Wheel

Jackson Buff Corp., Long Island City, N. Y.. is offering the Airway ventilated contact wheel for abrasive belt polishing. It is designed for



contour or flat work on stainless or carbon steel stampings, aluminum, brass, die castings or forgings. Maximum resilience is offered by the wheel, which yields readily to pressure, springing back into shape quickly.

Ventilation feature of the wheel makes it suitable for high speed contour polishing. Wheels are available in 6 to 16 inch diameters in standard sections of ½-inch face. Width of wheel face can be changed to suit each job.

Check No. 16 on Reply Card for more Details

Dust Separator

Employing wet methods to remove from the air the dust and foreign particles that result from polishing, buffing and grinding operations, the Niehaus dust separator, made by Industrial Electroplating Co. Inc., 219 West Vermont St., Indianapolis 4, Ind., discharges clean air out of the top of the machine into the shop, thus eliminating heat loss. Refuse is collected in a portable tank beneath the unit.

Separator is designed to provide a 2-inch static pressure for exhausting four regular size buffing or polishing wheels up to 16 inches in diameter. Where conditions require, it supplies 4-inch negative pressure for three wheels and a maximum of six inches pressure is available for exhausting

PUMP BUSHINGS HELD TOGETHER

Topflight Tape used to bind and identify

The Drilling Equipment Mfg. Co. of Oklahoma City, manufacture many items used in drilling and plumbing oil wells. They have found printed pressure-sensitive Topflight Tape ideal for a number of uses. Among other components, they make brass bushings for oil well pumps in various sizes. They are sent out "split" in half, through the diameter of the bushing, so that they can easily be placed around the rod of the pump.

Rough handling

Complete bushings must be sent out as units. Strong, laminated cellophane, not only holds the parts together, but provides a neat lustrous advertising label, as well. Here C. L. Knight of the Drilling Equipment firm, shows how bushing parts are quickly secured and labeled with Topflight Tape.

TOPFLIGHT TAPE COMPANY

ERWIN HUBER, *President*

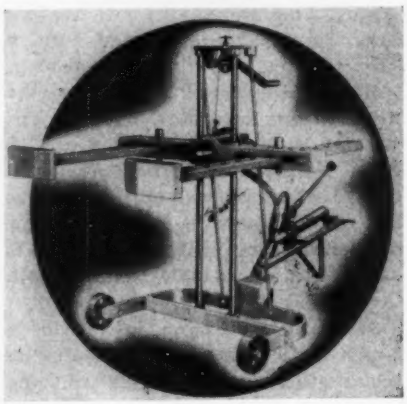
YORK PENNA.

two wheels. Motor, pump and motor controls are included.

Check No. 17 on Reply Card for more Details

Pulley Puller

Removal of almost any object from a motor shaft is simplified with a portable, hydraulic pulley puller manufactured by Industrial Engineering Equipment Co., Davenport 2, Ia. Even rusted, fast stuck pulleys and gears can be removed by the de-



vice which can be handled by one man.

Pressure is applied to hydraulic jack by a hand pump. Three adjustments set puller to dimensions required. Beams, arms, jack and pump can be removed from puller stand for overhead or other special uses. Large size is mounted on wheels and exerts 20 tons pressure and small size is mounted on a flat stand with a 5 ton rated capacity. A special ram adapter can be obtained to handle shafts of nearly any diameter.

Check No. 18 on Reply Card for more Details

• • •

CENTER REAMERS: Finishing to centers after heat treatment is possible with the carbide micro center reamers announced by Severance Tool Industries Inc., 770 Iowa St., Saginaw, Mich. A burnished-like finish is obtainable in centers of parts having a hardness up to rockwell C 63. Offered in ⅜ and ½-inch diameters, they have a standard 60 degree angle.

Check No. 19 on Reply Card for more Details

GRANITE STRAIGHT EDGE: Accuracy of 0.0001-inch every 3 feet of length is claimed for the granite straight edge made by Herman Stone Co., Dayton 2, O. Nonwarping in nature, they are offered in sizes up to 6 feet and have handles for easy handling.

Check No. 20 on Reply Card for more Details

STUD AND NUT SET: West Point Mfg. Co., Farmington, Mich., is producing a stud and nut set, available in ¾, ⅝ and ½-inch standard thread sizes in a class 3 fit. Each set includes four each of 3, 4, 5, 6, 7 and 8-inch studs, four each of the nuts, washers, t-slot nuts and coupling nuts. All parts are cadmium plated.

Check No. 21 on Reply Card for more Details

MOTOR MOUNT: For original installation on ¼ and ⅓ horsepower capacitor motors, the FHP motor mount, designed by Lord Mfg. Co., Erie, Pa., is of one piece construction and requires no bolts, nuts, straps or special tools for installation. It fits NEMA standard bases.

Check No. 22 on Reply Card for more Details

ROTARY TAP SWITCH: Easter Specialty Co., Philadelphia 40, Pa., is announcing the Tesco rotary tap switch, each section of which has seven active positions and one off position and is rated at 50 amperes, with an overload capacity of 75 amperes. As many as 12 switch sections in tandem may be operated in parallel to handle 600 amperes.

Check No. 23 on Reply Card for more Details

STRAPPING TOOLS: A new stretcher (B2AO) and a sealer (C2A), designed by Strapping Division of Acme Steel Co., Chicago 8, Ill., provide the means of applying flat steel strapping to packs where strapping operating surface is limited. They are successful in applying a tight strap around packages as small as 1 inch in diameter.

Check No. 24 on Reply Card for more Details

OPEN-END WRENCH: Designed for use on pipe, tube, conduit, cable and rod fittings, the T.A.C. open-end ratchet wrench manufactured by C. J. Hendry Co., San Francisco, Calif., operates in a 7½ degree arc or less, making it suitable for restricted area operation. Heads, sockets and accessories in various sizes are available.

Check No. 25 on Reply Card for more Details

RUBBER MAT: Relief of fatigue from standing is obtained from the Stand-Eze nonskid rubber mat containing more than 2000 small resilient cells, made by Colonial Rubber Co., Ravenna, O. Mats, which may be cleaned with soap and water, measure 16 x 23½ inches and are available in various colors.

Check No. 26 on Reply Card for more Details

WELDING, HEATING TORCH: Model 160 and 160-G welding and heating torch, made by Weldit Inc., Detroit 6, Mich., is a 3-hose torch, using two tanks of acetylene and one of oxygen. It has a quick operating cut-off which automatically shuts off the oxygen supply. A two-valve control makes possible use of propane, natural gas, etc. for heating.

Check No. 27 on Reply Card for more Details

UNDERPRIMER COAT: A quick drying anticorrosive underprimer which combines metal surface treatment with high anchorage of top coats and excellent adhesion to a variety of surfaces is Perma-Skin Underprimer, developed by Dennis Chemical Co., St. Louis, Mo. It can be used with practically all conventional finishing materials, such as oleoresinous paints, alkyds, baking enamels, lacquers, etc.

Check No. 28 on Reply Card for more Details

ANALYZER: Rapid electrolytic removal of heavy metals from aqueous solutions of reactive metals is attained by the Mercalyzer mercury cathode analyzer, developed by Precision Scientific Co., Chicago 47, Ill. The 0 to 10 volt range of applied potential and the range of direct current (0 to 10 amperes) permits fast removal of large quantities of the metals. Two amalgamations, two electrodepositions or one of each can be made at one time.

Check No. 29 on Reply Card for more Details

OIL CONDITIONER: A thermosiphon oil conditioner that absorbs moisture, acid and sludge from transformer oil continuously while the transformer is in operation is announced by Westinghouse Electric Corp., Pittsburgh 30, Pa. The conditioner, manufactured by Honan-Crane Corp., maintains oil properties as long as the absorbent material is effective.

Check No. 30 on Reply Card for more Details

BORING, FACING TOOLS: Additions to the line of single point boring and facing tools made by Bokum Tool Co., Detroit 21, Mich., includes a No. 00000 style A boring tool which makes possible boring of $\frac{1}{16}$-inch holes and style B which permits facing and bottoming of holes $\frac{1}{16}$-inch in diameter. Extra length tools also are available.

Check No. 31 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

STEEL PRICES— Sharp general increase in steel prices, announced last week by subsidiaries of the United States Steel Corp. and followed within a day or two by most of the independent steelmakers, has jolted consumers more severely than for many a moon. The fact new price schedules are not uniform among producers also is a factor lending to confusion in the market.

Coming on top of added freight costs resulting from abandonment of basing point pricing, the price hike, averaging over $9 per ton, and in case of some specific products being as much as $17, in the view of some steel buyers, may result in pricing some manufactured articles out of the market. This, they say, is especially true considering the continued rise in wage and other costs.

Substantial price hikes can be expected on any article made of metals reflecting the impact of recent and current wage and raw material costs. While in the case of automobiles and refrigerators, for example, the increased cost of steel is estimated at $10 to $15 and $1.25 to $1.50, respectively, other costs, including third round wage increases, have not been passed on to consumers. Consequently, increases of $10 to $20 in refrigerators, $50 to $100 in automobiles and similarly higher prices on dozens of other products would not be surprising. Exact figures as to the increased steel bill to consumers is impossible to determine as yet, but it will run into the hundreds of millions of dollars.

SCRAP MARKET— In the midst of the confusion and excitement in the steel market attending the application of higher product prices and abandonment of the basing point method of quoting, the scrap market is erupting again. Scrap is scarce and reports have been current for several weeks past of material moving above mill formula prices. Last week a definite break in the steel mill formula developed with an advance of $2.50 per ton reported at several leading market centers with the formula ceiling under pressure from consumers who have been shipping scrap direct to the steel mills and who now must pay sharply higher steel prices.

Along with the stronger tone in the scrap market pig iron also is tending upward with several producers effecting increases of $4 to $4.50 per ton over the past several days.

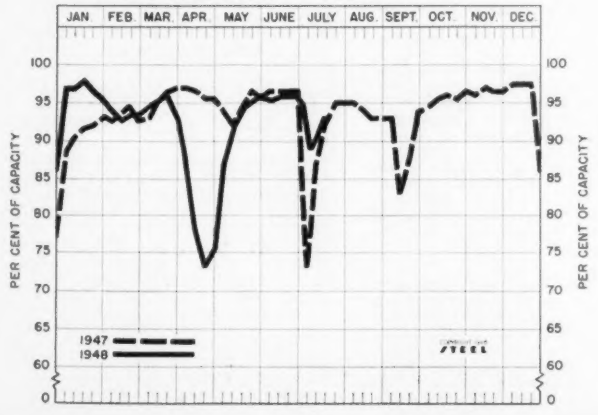
DEMAND PROSPECTS— Whether the higher steel prices will immediately discourage buying to any appreciable extent is debatable. Demand from some directions may be affected adversely, large building construction and similar projects for example. In the main, however, it is thought general market requirements are so far in excess of supply any buying slump developing in one direction will be quickly taken up from another.

WASHINGTON REACTION— There is considerable speculation as to how the price advance will influence thinking in Congress. Most observers are convinced the steel hike gives President Truman more ammunition in his drive to reimpose some form of price control. That it provides food for spirited debate in the special session this week is taken for granted.

In this political campaign year, with inflation the most pressing domestic problem before the country, there is no question the steel price hike may influence a strong drift toward price controls. Congress has balked all recent administration efforts in this direction but this provides no assurance the steel industry will not be singled out for a "whipping boy".

COMPOSITE PRICES— Due to the fluid situation with respect to steel prices currently, STEEL's arithmetical price composites are preliminary for the week ended July 24. They advanced to $86.82 from $80.27 on finished steel and compared with $69.14 for the like week a year ago; and to $41.52 from $40.74 on steelmaking pig iron against $35.61 a year ago. The steelmaking scrap price composite advanced $1.67 to $42.50 from $40.83 last week.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended July 24	Change	Same Week 1947	Same Week 1946
Pittsburgh	92	+ 7	97	95
Chicago	88	— 1	93.5	83.5
Eastern Pa.	90	None	94	87
Youngstown	100	+ 6	90	88
Wheeling	89	— 3	86.5	93.5
Cleveland	99	+ 4.5	92	92
Buffalo	101	None	88.5	88.5
Birmingham	100	None	99	99
New England	83	None	90	87
Cincinnati	96	— 2	87	84
St. Louis	78	— 4	84.5	54.5
Detroit	100	None	92	83
Estimated national rate	93	+ 2.5	95	86.5

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	July 24	July 17	Month Ago June 1948	Year Ago July 1947	5 Years Ago July 1943
Finished Steel	$86.82	$80.27	$80.27	$70.80	$56.73
Semifinished Steel	72.65	68.62	68.62	53.04	36.00
Steelmaking Pig Iron	41.52	40.74	40.49	33.82	23.00
Steelmaking Scrap	42.50	40.67	40.67	37.23	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

June 1948	3.58150c
May 1948	3.58321c
June 1947	3.12729c
June 1943	2.47708c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (rerolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†**FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. June, 1948, figure is preliminary.

COMPARISON OF PRICES

Nominal market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	July 24, 1948	June 1948	Apr. 1948	July 1947
Steel bars, Pittsburgh	2.875c	2.875c	2.90c	2.66c
Steel bars, del. Philadelphia	3.365	3.365	3.356	2.98
Steel bars, Chicago	2.875	2.875	2.90	2.66
Shapes, Pittsburgh	2.775	2.775	2.80	2.56
Shapes, del. Philadelphia	2.98	2.98	2.968	2.64
Shapes, Chicago	2.775	2.775	2.80	2.56
Plates, Pittsburgh	2.925	2.925	2.95	2.71
Plates, del. Philadelphia	3.21	3.21	3.19	2.85
Plates, Chicago	2.925	2.925	2.95	2.71
Sheets, hot-rolled, Pittsburgh	2.775	2.775	2.80	2.56
Sheets, cold-rolled, Pittsburgh	3.50	3.50	3.55	3.27
Sheets, No. 10 galv., Pittsburgh	3.90	3.90	3.95	3.63
Sheets, hot-rolled, Gary	2.775	2.775	2.80	2.56
Sheets, cold-rolled, Gary	3.50	3.50	3.55	3.27
Sheets, No. 10 galv., Gary	3.90	3.90	3.95	3.63
Strip, hot-rolled, Pittsburgh	3.05	3.05	3.05	2.56
Strip, cold-rolled, Pittsburgh	3.775	3.775	3.80	3.27
Bright basic, bess, wire, Pittsburgh	3.725	3.725	3.775	3.475
Wire nails, Pittsburgh	5.125	5.125	5.20	3.975
Tin plate, per base box, Pittsburgh	$6.60	$6.60	$6.70	$5.75

Semifinished

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$60.00	$47.50
Slabs, Pittsburgh, Chicago	45.00	45.00	45.00	38.92
Rerolling billets, Pittsburgh	45.00	45.00	45.00	38.92
Wire rod 7/32 to 1/4-inch, Pitts.	3.175c	3.175c	3.175c	2.63c

Pig Iron

	July 24, 1948	June 1948	Apr. 1948	July 1947
Bessemer, del. Pittsburgh (N.&S. Sides)	$44.08	$44.08	$40.996	$36.03
Basic, Valley	39.00	39.00	39.00	34.20
Basic, eastern del. Philadelphia	42.17	42.17	42.004	36.47
No. 2 fdry., del. Pgh. (N.&S. sides)	43.58	43.58	40.496	35.53
No. 2 fdry., del. Philadelphia	42.67	42.67	42.504	37.21
No. 2 foundry, Chicago	41.00	39.00	39.00	34.20
No. 2 foundry, Valley	39.50	39.50	39.50	34.70
Southern No. 2, Birmingham	41.38	39.38	37.88	31.98
Southern No. 2, del. Cincinnati	47.09	45.09	42.23	36.85
Malleable, Valley	39.50	39.50	39.50	34.70
Malleable, Chicago	41.50	39.50	39.50	34.70
Charcoal, low phos., fob Lyles, Tenn.	62.00	58.00	55.00	43.00
Ferromanganese, fob cars, Pittsburgh	151.00	151.00	151.00	140.25

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.25	$40.25	$37.20
Heavy melt. steel, No. 2, E. Pa.	39.00	39.00	39.00	38.06
Heavy melt. steel, No. 1 Chicago	41.75	39.25	39.10	35.95
Heavy melt. steel, No. 1, Valley	40.25	40.25	40.25	37.35
Heavy melt. steel, No. 1, Cleveland	39.75	39.75	39.75	37.65
Heavy melt. steel, No. 1, Buffalo	44.00	43.00	43.00	37.90
Rails for rerolling, Chicago	60.00	53.75	49.50	43.20
No. 1 cast, Chicago	68.50	68.38	68.40	41.10

Coke

Connellsville, beehive furnace	$13.00	$13.00	$12.55	$11.20
Connellsville, beehive foundry	15.50	15.22	14.875	13.05
Chicago, oven foundry, del.	20.80	20.80	19.25	17.46

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality $46 per net ton, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56 per gross ton.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Buffalo, Birmingham, $45 per net ton; Cleveland, $47 per net ton; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $54 per net ton.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66 per gross ton.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60 nom., per net ton; sales in open market $95-$105 per gross ton.

Skelp: Pittsburgh, 2.85-2.90c; Youngstown, 2.90c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-70 per net ton; some sellers quoting up to $120 per gross ton.

Wire Rods: Pittsburgh, Chicago, Birmingham, 7/32 to 1/4-in., inclusive, $2.80-3.55 per 100 lb. 5/16 to 47/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.5245.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): Pittsburgh, Youngstown, Chicago, Gary, Birmingham, 2.85-2.90c; Cleveland, Buffalo, 2.90c; Detroit, del., 3.11c; eastern Mich., 3.18c; New York, del., 3.43c; Phila., del., 3.34-3.39c; San Francisco (base, del.), 3.5845-3.95c; Los Angeles (base, del), 3.579-3.86c; Seattle, 3.8375-3.85c, base.

Reinforcing Bars (New Billet): Pittsburgh, 2.70-2.75c; Chicago, Gary, Youngstown, Birmingham, 2.70c; Sparrows Point, Buffalo, base 2.75c; San Francisco (base, del.), 3.3345c; Los Angeles (base, del.), 3.329c; Seattle, 3.88c-4.18c base.

Iron Bars: Single refined: Pittsburgh 7.70c (hand puddled), Economy, Pa., 8.65c. Double refined: Pittsburgh 9.75c (hand puddled), Economy, Pa., 10.00c. Staybolt: Pittsburgh 11.25c (hand puddled), Economy, Pa., 10.20c.

> Companies producing a major portion of steel products are now selling on a straight mill or shipping point basis. Other companies which are expected to adopt this policy have not yet done so. Prices quoted on these pages are those which were in effect prior to the changeover and subsequent advances.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.75-2.80c; Cleveland, Buffalo, Sparrows Point, Ashland, Ky., base, 2.80c; Detroit, del., 3.01c; eastern Mich., del., 3.08c; Philadelphia, del., 3.06c; New York, del., 3.18c; Los Angeles (base, del.), 3.494-3.544c; San Francisco, (base, del.) 3.4995-3.5495c. (Alan Wood Steel Co., Conshohocken, Pa., quotes 4.20c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Gary, 3.45-3.55c; Cleveland, Middletown, 3.50-3.55c; Buffalo, Youngstown, Sparrows Point, 3.55c; Granite City, 3.65c; Detroit, del., 3.66-3.76c; eastern Mich., del., 3.73-3.83c; New York, del., 3.93c; Philadelphia, del., 3.81c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Gary, Birmingham, 3.85-3.95c; Chicago, Sparrows Point, Canton, Middletown, 3.95c; Kokomo, 4.55c; Youngstown, 3.95-4.45c; Granite City, 4.05c; New York, del., 4.33c; Philadelphia, del., 4.21c; Los Angeles (base, del.), 4.624c; San Francisco (base, del.), 4.6295c.

Culvert Sheets, No. 16 flat (based on 5-cent zinc; corrugated 10 cents extra): Copper alloy: 4.45-4.55c, Pittsburgh, Gary; 4.55c Chicago; 4.90c, Kokomo; 5.00c, Granite City; 5.344c (base del.), Los Angeles; 5.3495c (base del.), San Francisco.
Copper-iron or pure iron: 4.80-4.90c, Pittsburgh; 4.80c, Gary, 4.90c, Chicago, Kokomo, Canton; 5.35c, Granite City.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 4.05c.

Enameling Sheets, No. 12: Pittsburgh, 3.85-3.95c; Chicago, Gary, 3.75-3.95c; Cleveland, Middletown, 3.85c; Youngstown 3.95c-4.45c; Granite City, 4.05c; Detroit, del., 4.16c; eastern Mich., 4.23c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.40-4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, 4.70-5.30c; Chicago, Gary, 4.70-4.80c; Granite City, Ill., 5.25c; Kokomo, Ind., 4.90c. Electrical: Pittsburgh, 5.20-5.80c; Chicago, Gary, 5.20-5.30c; Granite City, Ill., 5.75c; Kokomo, Ind., 5.40c. Motor: Pittsburgh, 5.95-6.80c; Chicago, Gary, 5.95-6.05c; Granite City, 6.50c. Dynamo: Pittsburgh, 6.65-7.00c; Granite City, 7.20c. Transformer 72, 7.15-8.25c; 65, 7.85-9.20c; 58, 8.55-9.90c; 52, 9.35-9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, 2.80c-3.30c; Chicago, Gary, Birmingham, Youngstown, Cleveland, 2.75-2.80c; Detroit, del., 3.01c; eastern Mich., del., 3.08c; San Francisco (base, del.) 3.5595c; Los Angeles (base, del.), 3.554c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, 3.50-4.05c; Cleveland, 3.45-3.85c; Youngstown, 3.55-3.85c; Chicago, Gary, 3.55-3.65c. Detroit, del. 3.66-3.76c; eastern Mich., 3.73-3.83c; Worcester, base, 3.65-3.75c.

Cold-Finished Spring Steel: Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 4.95-5.05c; over 0.60 to 0.80, 5.55-5.65c; over 0.80 to 1.05, 7.05-7.15c; over 1.05 to 1.35, 8.35-9.45c; add 0.20c for Worcester.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, per base box of 100 lb, 1.25 lb coating $6.50, 1.50 lb coating $6.70; Sparrows Point, Birmingham and Warren, O., $6.60 and $6.80, respectively; Granite City, $6.70 and $6.90, respectively.

Electrolytic Tin Plate: Pittsburgh, Gary, per base box of 100 lb, 0.25 lb tin, $5.70; 0.50 lb tin, $5.90; 0.75 lb tin $6.10; Sparrows Point, Birmingham and Warren, O., $5.80, $6.00, $6.20, respectively; Granite City, $5.90, $6.10, $6.30, respectively.

Can Making Black Plate: Pittsburgh, Gary, per base box of 100 lb, 55 to 70 lb basis weight, $5.10; 75 to 95 lb basis weight, $5.00; 100 to 128 lb basis weight, $5.10. Birmingham and Warren, O., $5.20, $5.10, $5.20, respectively.

Hollowware Enameling Black Plate: Pittsburgh, Chicago, Gary, base 29-gage, 4.65c per lb; Sparrows Point, Warren, O., 4.75c; Granite City, 4.85c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, per base box of 100 lb, $5.80; Birmingham, Sparrows Point, $5.90; Granite City, $6.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.30.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.90-2.95c; Cleveland, Sparrows Point, 2.95c; Coatesville, 3.45c; Claymont, 3.65c; Geneva, Utah, 2.90c; Det., del., 3.21c; New York, del., 3.33c; Phila., del., 3.21c; Boston, del., 3.51c; St. Louis, del., 3.269c; San Francisco and Los Angeles, del., 3.493c for sizes and grades produced at Geneva; 3.76c for sizes and grades produced at Fontana, Calif.
(Central Iron & Steel Co., Harrisburg, Pa., 5.10c, basing points.)

Floor Plates: Pittsburgh, 4.05c; Chicago, 3.95-4.05c; Gary, 3.95c; Cleveland, 4.05-4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Gary, 3.70c; Coatesville, 4.80c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 24.00c.

Wrought Iron: Economy, Pa., 7.25c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, 2.75-2.80c; Buffalo, Bethlehem, 2.80c; New York, del., 3.06c; Phila., del., 2.98c; Geneva, Utah, 2.75c; Los Angeles (base, del.), 3.424-3.474c for sizes produced at Torrance, Calif.; Los Angeles and San Francisco, del., 3.343c for sizes produced at Geneva, 3.81c for sizes produced by Bethlehem in East; San Francisco, del., 3.54c for sizes produced at Fontana, Calif.

Beams, Wide Flange: Pittsburgh, Chicago, 2.70c.

Alloy Structural Shapes: Pittsburgh, Chicago, Gary, 3.45-3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds.)

Wire to Manufacturers in carloads

Bright, basic or bessemer..... *$3.45-4.00
Basic MB Spring (except Birm.)..**$4.85-4.95
Upholstery Spring (except Birm.) †$4.50-4.60

Wire Products to Trade in carloads

Wire, Merchant Quality

Annealed (6 to 8 base).....††$4.10-4.20
Galvanized (6 to 8 base).....††$4.55-4.65

(Fob Pittsburgh, Chicago, Duluth, Birmingham, per base column).

Nails

Standard, cement-coated, galvanized.. ‡‡91-94
Staples, polished and galvanized..... ‡‡91-94
Woven fence, 15½ gage and heavier. §97-100
Barbed wire, 80-rod spool .....§§111-113
Fence Posts (with clamps)..... ★107
Bale ties, single loop .....★★94-100

* Worcester, $3.55; Duluth, $3.50; San Francisco (base, del.) $4.4645 bright basic only.
** Worcester, $4.95; Duluth & Trenton, N.J., $5.10 (bright only); San Francisco (base del.) $5.8845.
† Worcester $4.60; Duluth and Trenton, N. J., New Haven, Conn., $4.75; San Francisco (base, del.), $5.5345 black upholstery.
†† One producer quotes annealed, 4.45c, galvanized, 4.90c, Birmingham and Chicago; Worcester $4.20 annealed, $4.65 galvanized; Duluth $4.10 annealed, $4.55 galvanized; Kokomo, Ind., $4.80 annealed, $5.25 galvanized; San Francisco (base, del.) $5.1145 annealed, $5.5645 galvanized.
‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester, Cleveland 97; Duluth, 91; San Francisco (base, del.) 112.
‡‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 97; San Francisco (base del.) 112.
§ Col. 101 also quoted at Pittsburgh; San Francisco (base del.) 120.
§§ San Francisco (base del.) 131.
★ Duluth, 104.
★★ San Francisco (base del.) 118; Chicago, Birmingham, 94-99.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.70-$2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.05 per 100 lb; light rails (rail-steel), prices upon application. Relaying, 60 lb and over fob warehouse $60-$65 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates $3.55-$3.65 per 100 lb, fob mill; $3.40 base, Seattle; $3.70 fob Pittsburg, Calif. Splice bars $3.75-$3.85 per 100 lb fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles 4.45-4.50c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 to 2 points less on steel butt weld on sizes produced in that district.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	44½	17	1	52½–53½	36½–37½
¼	44½	21½	1¼ ...	53–54	37–38
⅜	41	17	1½ ...	53½–54½	37½–38½
½	47–48	29½–30½	2	54–55	38–39
¾	50–51	33½–34½	2½, 3..	54½–55½	38½–39½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	44½	28	44	27½	43½	27
2½ & 3	48½	32	47	30½	46½	30
3½-6 ..	50½	34	49	32½	48½	32

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

	Butt Weld		Butt Weld
In.		In.	
⅜	43½	1	51½-52½
¼	43½	1¼	52-53
⅜	40	1½	52½-53½
½	46–47	2	53-54
¾	49–50	2½ & 3....	53½-54½

In.	Lap Weld	Elec. Weld	Seamless
2	43½	43	42½
2½ & 3	46½	46	45½
3½-6	48½	48	47½
8	50½	50	49½
10	50	49½	49
12	49	48½	48

Standard Wrought Iron Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh.

	Butt Weld		Lap Weld	
In.	Blk.	Gal.	Blk.	Gal.
⅜...	+46½	+74½	+12	+34½
½...	+11	+35	+ 6	+27½
¾...	+ 1½	+25	— 1½	+20
1 and 1¼	— 4	+16½	— 4	+16
1½..	— 9½	+13	— 8	+10½
2....	—10	+12½	— 6	+12
			9-12 .	+ 3	+21½

Boiler Tubes: Net base c.l. prices, dollars per 100′, fob Pittsburgh; minimum wall thickness, cut lengths 4 to 24″, inclusive.

Prices effective as of May 1, 1948.

		Seamless		Elec. Weld	
O.D. In.	B.W. Ga.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1	13	.....	12.21-12.46	11.51	11.51
1¼	13	.....	14.46-14.76	11.48	13.64
1½	13	13.72-14.00	16.14-16.47	12.69	15.22
1¾	13	15.60-15.92	18.37-18.74	14.43	17.31
2	13	17.48-17.84	20.57-20.99	16.17	19.39
2¼	13	19.48-19.88	22.93-23.40	18.02	21.62
2½	12	21.46-21.90	25.25-25.77	19.86	23.80
2½	12	23.51-23.99	27.65-28.21	21.75	26.06
2¾	12	24.91-25.42	29.30-29.90	23.05	27.63
3	12	26.15-26.68	30.77-31.40	24.18	29.00
3¼	11	30.44-31.06	35.82-36.55	28.16	33.77
3½	11	32.68-33.35	38.47-39.26	30.23	36.27
4	10	40.57-41.40	47.73-48.70	37.53	44.99
4½	9	53.77-54.87	63.29-64.58	....	....
5	9	62.25-63.52	73.25-74.74	....	....
6	7	95.56-97.51	112.44-114.73	....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step, plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ¾ x 6-in. and shorter.....	46 off
¾-in. and larger x 6-in. and shorter.	43 off
All diameters longer than 6-in.....	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts, 6 in. and shorter.....	46 off
Lag bolts, longer than 6 in.....	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in. and smaller.....	46 off	.....
½-in. and smaller.....	.....	44 off
½-in.-1-in.	44 off	.....
⅝-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger.....	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright).....	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter.....	48 off
¾, ⅞, & 1 x 6 and shorter.....	44 off

Square Head Set Screws

Upset 1-in. and smaller.....	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pitts., Cleve., Chicago, Birmingham
Structural ½-in. and larger..... 5.65c
Fob Lebanon, Pa.
Structural ½-in. and larger..... 5.65c*
7/16-in. and larger ..... 55 off*

* Plus 19c per cwt in cl; 26c in lcl.

Washers, Wrought

Fob Pitts., Chicago, Philadelphia, to jobbers and large nut and bolt mfrs.....$1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, cents per lb, Pittsburgh, Chicago, Cleveland, Bethlehem, Canton, Massillon, Middletown, Watervliet, Dunkirk, Syracuse, Reading, Ft. Wayne, Titusville, Brackenridge, Jersey City, W. Leechburg, Baltimore and Washington, Pa.

Grade	Bars, Wire, Shapes	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28.00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	36.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50*	51.00*	40.50	51.00
310....	53.50	56.50†	57.50‡	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49.00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A ..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
410....◦	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	26.00	39.50
430....	21.00	24.00	31.50	19.00	24.50
430F ..	21.50	24.50	32.00	20.50	27.00
442, 443	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
§501...	9.00	13.00	17.50	13.00	18.50
§502...	10.00	14.50	18.50	14.50	19.50
****STAINLESS CLAD STEEL (20%)**					
304....	....	24.00	22.00	....	....
410....	....	22.00	20.00	....	....
430....	....	22.50	20.50	....	....
446....	....	29.00	27.00	....	....

One producer quotes: * 6.50c higher, † 3.50c higher, ‡ 10.00c higher. § Low chromium. ◦◦ Fob Pittsburgh, Washington and Coatesville, Pa.; plate prices include annealing, pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$40.00	$40.50	$41.00	$41.50
Newark, N. J., del.	42.39	42.89	43.39	43.89
Brooklyn, N. Y., del.	....	44.40	44.90	....
Philadelphia, del.	42.17	42.67	43.17	43.67
Birmingham, furnace	38.88-42.88	39.38-43.38	....	....
Cincinnati, del.	....	45.09-49.09	....	....
Buffalo, furnace	40.00†	40.00†	40.50†	41.00
Boston, del.	48.42	48.42	48.92	....
Rochester, del.	42.22	42.22	42.72	43.22
Syracuse, del.	43.025	43.025	43.525	44.025
Chicago, furnace	42.50	43.00	43.50	44.00
Milwaukee, del.	44.22	44.72	45.22	45.72
Muskegon, Mich., del.	....	47.98	48.48	....
Cleveland, furnace	43.00	43.50	43.50	44.00
Akron, del	45.17	45.67	45.67	46.17
Duluth, furnace	43.00	43.50	43.00	43.50
Erie, Pa., furnace	42.50	43.00	43.50	43.00
Everett, Mass., furnace	....	48.75	49.25	....
Granite City, Ill., furnace	45.25	45.75	46.25	....
St. Louis, del.	46.00	46.50	47.00	....
‡Neville Island, Pa., furnace	42.00	42.50	42.50	43.00
Pittsburgh, del., N.&S. Sides	43.08	43.58	43.58	44.08
Provo, Utah, furnace	40.00	40.50	....	....
Seattle, Tacoma, Wash., del.	....	47.63	....	....
Portland, Oreg., del.	....	47.63	....	....
Los Angeles, San Francisco	47.13	47.63	....	....
Sharpsville, Pa., furnace	43.00	43.50	43.50	43.00
Steelton, Pa., furnace	40.00	40.50	41.00	41.50
Struthers, O., furnace	42.50	....	....	....
Swedeland, Pa., furnace	45.00	45.50	46.00	46.50
Toledo, O., furnace	42.50	43.00	43.50	43.00
Cincinnati, del.	47.05	47.55	....	....
Youngstown, O., furnace	39.00	39.50	39.50	40.00
Mansfield, O.	42.87	43.37	43.37	43.87

† Republic Steel Corp. quotes $2.875 higher for No. 2 foundry and malleable and $2.375 higher for basic at Buffalo, and $1.25 higher at Cleveland, effective on shipments during week ended July 25.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)	$53.50		
6.51-7.00	$54.75	9.01- 9.50	61.00
7.01-7.50	56.00	9.51-10.00	62.25
7.51-8.00	57.25	10.01-10.50	63.50
8.01-8.50	58.50	10.51-11.00	64.75
8.51-9.00	59.75	11.01-11.50	66.00

Fob Jackson, O., per gross ton; Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$62 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $42.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $46.00. Philadelphia, $48.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $46.00.

Differentials

Prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$12.00-$14.00†
Connellsville, foundry	14.50- 16.50†
New River, foundry	15.50
Wise county, foundry	14.25
Wise county, furnace	13.50

† Nominal.

Oven Foundry Coke

Kearney, N. J., ovens	$21.50
Chicago, outside del.	19.50
Chicago, del.	20.80
Terre Haute, ovens	21.00
Milwaukee, ovens	20.25
New England, del.	22.75
Birmingham, del.	17.86
Indianapolis, ovens	20.85
Cincinnati, del.	21.40
Ironton, O., ovens	18.25
Erie, Pa., del.	22.45
Painesville, O., ovens	20.90
Cleveland, del.	22.45
Buffalo, del.	23.10
Detroit, del.	21.65
Philadelphia, ovens	20.55
Swedeland, Pa., ovens	20.50
Portsmouth, O., ovens	18.25

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	21.00†
Toluol, two degrees	28.00
Industrial xylol	28.00
Solvent naphtha	28.00

Per pound fob works

Phenol (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	12.00

Per ton, bulk, fob plants

Sulphate of ammonia	$40.00

† Freight allowed up to 2 cents.

Refractories

(Prices per 1000 brick, fob plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, or Farber, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., $86; St. Louis, or Farber, Vandalia, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty; St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., Bessemer, Ala., $66.

Ladle Brick

Dry Press: $50.

Wire Cut: $48.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, fob works, Chewelah, Wash.)

Domestic dead-burned, ¾" grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned, bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Siding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

Swedish basic, 60 to 68%	14.50
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Cleveland	Bethlehem	Canton Massillon
Sheet, Hot-Rolled	4.20	4.20-4.30	4.20-4.30	4.20-4.30	4.30	4.30	4.20	...	...
Cold-Rolled	5.20	5.20-5.30	5.20-5.30	5.20-5.30	...	5.30	5.20	...	...
Galvanized	5.90	.....	.....	.....	...	6.00	...	...	...
Strip, Hot-Rolled	4.20	4.30	4.20-4.30	4.20-4.30	...	...	4.20	...	...
Cold-Rolled	5.20	5.30†	5.30†	5.30	...	...	5.20	...	...
Shapes, Structural	4.20	4.20-4.30	4.20	4.30	...	...	...	4.30	...
Plates	4.45	4.45-4.55	4.45-4.55	.....	4.55	...	...	...	...
Bars, Small Shapes	4.35	4.35-4.45	4.35-4.45	4.35-4.45	...	4.45	...	...	4.45

† Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, subject to extras; city prices, for delivery within switching limits.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Structural Shapes§§	Carbon ⅝"-¾"	Floor ⅝" & Thicker
Boston (city) ..	5.08	5.84[4]	6.28[4]	5.64	6.90	5.09	5.96	7.70	4.94	5.23	6.89
Boston (c'try)..	4.98	5.64[4]	6.08[4]	5.44	...	4.89	...	...	4.74	5.03	6.69
New York (city)	4.94	5.80	6.13	5.58	...	5.05	5.78	7.23	4.77	5.09	6.58
New York (c'try)	4.79	5.65	5.98	5.43	...	4.90	...	...	4.62	4.94	6.43
Phila. (city)...	4.87	5.81	5.92	5.36*†	...	4.91	5.73	7.30	4.59	4.87	6.36
Phila. (c'try.)..	4.72	5.66	5.77	5.21*†	...	4.76	...	...	4.44	4.72	6.21
Wash. (city) ..	4.81	...	...	5.08	...	5.14	5.79	...	4.98	5.03	6.68
Wash. (c'try.) .	4.71	...	...	4.98	...	5.04	...	...	4.88	4.93	6.58
Balt. (city) ...	4.27†	5.59	5.62	4.79	...	4.84	5.66	...	4.69	4.72	6.09
Balt. (c'try.) .	4.12†	5.44	5.40	4.64	...	4.69	...	...	4.54	4.57	5.94
Norfolk, Va. ..	4.90	...	...	...	...	5.20	6.00	...	5.15	5.15	6.90
Memphis (city)	4.91[20]‡	5.98‡†	...	5.11[20]	...	5.01[20]	5.88	...	5.01[20]	5.21[20]	6.83[20]
Memphis (c'try)	4.81[20]‡	5.88‡†	...	5.01[20]	...	4.91[20]	5.78	...	4.91[20]	5.11[20]	6.73[20]
Buffalo (city) .	4.25	5.20[3]	6.05	5.25	5.97	4.40	5.10	6.85	4.40	5.00	6.25
Buffalo (c'try.)	4.10	5.05[3]	5.50	4.70	5.82	4.25	4.95	6.85	4.25	4.45	5.75
Pitts. (city) ..	4.20-4.25‡	5.05-5.10[3]†	5.60-5.65	4.30-4.35	5.35	4.35-4.40	5.05-5.10	6.70	4.35-4.40	4.55	5.90
Pitts. (c'try) ..	4.05-4.10‡	4.85-4.95[3]†	5.40-5.50	4.15-4.20	5.20	4.20-4.25	4.85-4.95	6.70	4.20-4.25	4.40	5.75
Cleve. (city) ..	4.45	5.10[3]	5.84	4.52	5.25	4.40	5.00-5.10	7.14	4.67	4.60	5.90
Cleve. (c'try.) .	4.30-4.90	4.95-5.75[3]	...	...	5.10	4.25	4.85-4.95	...	...	4.45	5.75
Detroit	4.66	5.31	6.10	4.75	5.97	4.61	5.49	7.47	4.80	4.95	6.25
Cincinnati	4.51-4.66	5.22	5.77	4.80	6.00	4.76	5.59	...	4.80	4.96	6.21
Indianapolis ...	4.52	5.01[3]	5.96	4.62	5.87	4.67	5.52	8.85	4.67	4.87	6.17
Chicago (city) .	4.40	5.10[3]	5.55-5.65	4.30	5.35	4.35	5.00	6.70[9]	4.35	4.55	5.80
Chicago (c'try.)	4.25	4.95[3]	5.40-5.50	4.15	5.20	4.20	4.85	6.70[9]	4.20	4.40	5.65
Milwaukee	4.62	5.32[3]	5.77-5.87	4.52-5.02	5.57	4.57	5.334	7.184[9]	4.57	4.77	6.02
St. Paul, Minn..	4.66[6]	5.56[3]†	6.01[3]	4.76	6.29[13]	4.81[6]	5.94[11]	7.84[11]	4.81[6]	5.01[6]	6.28[6]
St. Louis	4.79	5.49[3]	6.27	5.24	5.97	4.74	5.62[13]	8.97	4.74	4.94	6.19
Birming. (city).	4.45[20]‡	...	5.65	4.45[20]	...	4.40[20]	6.09[23]	...	4.40	4.65	6.99
Birming. (c'try.)	4.30[20]‡	...	5.50	4.30[20]	...	4.25[20]	...	...	4.25	4.50	...
Houston, Tex. .	5.75	...	7.36	6.00	...	5.70	7.00	9.25[9]	5.70	5.90	7.20
Omaha, Nebr...	5.31	...	6.76	5.41	...	5.46	6.96	...	5.41	5.66	5.65
Los Angeles ...	5.70‡	7.25[3]	7.30	6.00	8.60	5.45	7.25[1]	9.40[32]‡‡	5.15-5.30	5.35	7.40
Seattle-Tacoma.	5.45[17]‡	7.25[3]‡	7.10	6.15[17]	...	5.65[17]	7.35[1]	8.70[12]	5.30[17]	5.60[17]	7.65[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [13]—1000 lb and over; [16]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [32]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ annealed; §§ except wide flange beams, which are 0.05c lower; 12G. & heavier and includes machine straightening.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $52, Palmerton, Pa., $51, Pittsburgh; (16% to 19% Mn.) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $157, ton lot $172, less ton $189, fob New Orleans, Mobile, Philadelphia, Baltimore, New York. Carload, lump, bulk, $150 fob Rockwood, Tenn.; $150.50 fob Aetna, Pa., or $151.15 within Pittsburgh switching limits. Add or subtract $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 20.1c per lb of cotnained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D; packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50c per lb. of contained Si, fob Niagara Falls, N. Y.

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe.) Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for

(*Please turn to Page 148*)

Nonferrous Metals Remain Slow

Bookings are limited to new production. Prices of major metals hold; copper wire advances

New York—With the exception of nickel, major nonferrous metal markets have been unaffected directly by the general upswing in prices which has swept through the steel markets during the last few days. Undertone of the entire nonferrous metal price structure remained strong, however.

Copper—Production of crude copper in the United States in June reached the highest level in four years, amounting to 78,291 tons against 76,813 tons in May and 73,615 tons in June of last year, according to the Copper Institute. Output from secondary sources declined 5865 tons to 9141 tons, making total output from both sources 87,432 tons, or 4387 tons under the May total.

Production of refined copper amounted to 105,221 tons in June compared with 104,524 tons in the preceding month. Deliveries of refined copper to domestic consumers amounted to 111,927 tons, representing a further small decline of about 1450 tons. Of the total tonnage delivered, 900 tons were furnished by the Office of Metals Reserve. Non-industry exports amounted to 224 tons.

Stocks of copper at the refineries on June 30 amounted to 73,065 tons compared with 72,791 tons on May 30 and 82,542 on the like date a year ago.

Copper Wire—Phelps Dodge Copper Products Corp. announced that due to higher wages and other increased production costs its list prices for bare and weatherproof wire are advanced about 7½ per cent, magnet wire is up about 8 per cent, while increases in other products range from 5 to 10 per cent. This action was followed by an announcement by Anaconda Wire & Cable Co. that its base prices for bare, weatherproof and magnet wire are advanced from ¾-cent to 1¾-cents per pound. Of the four principal wire mills, Kennecott Wire & Cable Co. is the only one that has not recently advanced its prices.

Lead—Although the average daily rate of lead production from domestic mines in May dropped 98 tons or 8 per cent, the May output remained above the monthly average rate in 1947, according to the Bureau of Mines. May lead production, in terms of recoverable metal, was 33,652 short tons, an average of 1086 tons per day compared with 35,512 tons in April produced at an average rate of 1184 tons per day.

The combined production of lead in Arkansas, Kansas, Missouri, and Oklahoma totaled 12,336 tons in May. The average daily rate of output decreased 9 per cent from April and was 5 per cent under the daily average for 1947 due largely to a decline in production at the St. Joseph Lead Co. mills in southeastern Missouri.

May lead output in the combined western states remained well above the average monthly production in 1947 despite a 4 per cent decline in output as compared with April. The average daily production rate decreased from 706 tons in April to 658 tons in May.

Zinc—The average daily rate of zinc production from domestic mines continued to decline in May and, for the first time since February, dropped below the average daily output in 1947, according to the Bureau of Mines. May zinc production, in terms of recoverable metal, was 51,422 short tons, an average of 1659 tons per day compared with 53,042 tons in April produced at an average rate of 1768 tons per day.

Zinc output in states east of the Mississippi river decreased 6 per cent in May owing to declines in production at the St. Joseph Lead Co. Balmat mine and mines in Tennessee. The average daily rate of zinc production in Arkansas, Kansas, Missouri, and Oklahoma continued to increase in May.

Tin—Production of tin concentrates in the Netherlands East Indies in June was equivalent of 2414 gross tons of fine tin, of which 1458 tons came from Banka and 956 tons from Billiton and Singkep. This was down about 300 tons from May, but the total for the first six months was 13,962 tons, or twice that for the corresponding period in 1947. NEI export shipments during June were 385 tons lower at 2663 tons as compared with May. Of the June total, Holland took 1976 tons and the United States 687 tons against 2684 tons and 364 tons, respectively, in the previous month. NEI shipped 16,209 tons during the first half.

Nickel Prices Rise

Electrolytic nickel quoted 40.00c, Canadian refinery, including U. S. import duty

New York — International Nickel Co. Inc. advanced its United States contract price for electrolytic nickel from the Port Colborne, Ont., refinery to 40.00c per pound, effective July 22. The new price had prevailed for many years prior to 1921. The price includes the import duty paid by the company. The price was 35.00c per pound from November, 1946, to Jan. 1, 1948, when a duty reduction caused a 1.25-cent per pound decrease.

Simultaneously, the parent Canadian company announced like increases in the prices of refined nickel in Canada and the United Kingdom, keeping the prices in all three markets at the same level.

Nickle oxide sinter, a new lower cost form of nickle introduced last year, will be offered at 36.25c per pound of nickle content at Copper Cliff. Ont., where the new process plant under construction for this purpose is now in partial operation.

In commenting on the price increases, Robert C. Stanley, chairman and president of the International Nickel Co. of Canada Ltd., stated:

"The increased metal requirements of the world since prewar have placed a heavy drain on the ore reserves of the base metal producers. They have been forced to mine lower grade ore bodies with consequent increases of costs and upward pressure on prices.

"This company is now mining underground ores of considerably lower grade than in the prewar and it has decided in order to preserve a stable supply of nickel to start a long-range mining program which will open up a large underground ore body at Sudbury of a grade much below our average.

"In common with other industries, our costs of supplies and services and our labor rates have risen approximately 100 per cent from prewar levels. Our wage increases in Canada this June, together with previous increases granted in 1947 and 1948 alone, have added approximately $10 million per annum to our plant costs.

"The result is that in spite of the many plant and process changes we have introduced to effect economies, our costs have greatly increased and must be compensated for by a rise in the price of nickel.

"The company and its subsidiaries have deferred advancing their prices until it became entirely apparent that the increased cost factors could not be regarded as merely temporary phases of the postwar. In keeping with our long-range policy of developing new uses and broadening the demand for nickel, we have endeavored to keep the price as low as possible.

"The increases will bring the price of nickel to a level only 25 per cent above the prices generally prevailing in the prewar years. By comparison, the quoted prices of other base metals (copper, tin, zinc and lead) have increased from nearly 100 per cent to over 200 per cent.

"The increase in the nickel price will be helpful also in providing Canada with additional foreign exchange necessary to sustain her large and essential imports from the United States and other countries."

Sodium Cyanate Price Cut

Chicago — Reduction in price of sodium cyanate was announced last week by Edwal Laboratories Inc. Main beneficiaries of the price cut will be the iron and steel industry and manufacturers of tools, machines, farm equipment and other commodities which are case-hardened in molten salt baths containing sodium cyanate. New prices for the chemical are 85.00c per lb in drum lots, and 75.00c in tonnage lots. Old prices were $1.25 per lb in drum lots and $1.10 in tonnage lots.

According to Dr. Guthmann, head of Edwal, the market for sodium cyanate has become more diversified since prewar days. Many new manufacturers learned during the war production years that sodium cyanate hardens metal evenly in composition and depth, without having to heat chemical baths to extremely high temperatures or without having sludge deposits in the pot. As a result of this war production experience, said Guthmann, many manufacturers carried over this process into civilian production.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 21.50c, Conn. Valley; Lake, 21.62½c Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 19.50-20.00c; 88-10-2 (No. 215) 29.00c; 80-10-10 (No. 305) 25.25c; No. 1 yellow (No. 405) 15.25-16.00c.

Zinc: Prime western 12.00c, brass special 12.25c, intermediate 12.50c, East St. Louis; high grade 13.00c, delivered.

Lead: Common 17.30-17.35c; chemical and corroding 17.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 15.00-16.00c, pigs 13.50-15.00c; metallurgical 94% min. nom. 14.50c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 24.00-24.75c; No. 12 foundry alloy (No. 2 grade) 23.50-24.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.25-25.75c; grade 2, 24.50-25.00c; grade 3, 24.00-24.75c; grade 4, 23.50-24.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 35.00; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, nom.; shot, nom.; "F" nickel shot or ingots, for addition to cast iron, nom. Prices include import duty.

Mercury: Open market, spot, New York $76-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.75, del.; special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 74.62½c per ounce.

Platinum: $88-$91 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, fob mill.)

Sheet: Copper 35.18c; yellow brass 31.41c; commercial bronze, 95%, 35.05c; 90% 34.52c; red brass, 85% 33.48c; 80% 32.95c; best quality 32.34c; nickel silver, 18%, 43.42c; phosphotbronze, grade A, 5%, 54.15c.

Rods: Copper, hot rolled 31.28c; cold drawn 32.28c; yellow brass, free cutting, 25.94c; commercial bronze, 95% 34.74c, 90% 34.21c; red brass, 85% 33.17c, 80% 32.64c.

Seamless Tubing: Copper 35.22c; yellow brass 34.42c; commercial bronze 90% 37.18c; red brass 85% 36.39c, 80% 35.86c.

Wire: Yellow brass 31.70c; commercial bronze, 95% 35.34c; 90% 34.81c; red brass, 85% 33.77c, 80% 33.24c; best quality brass 32.63c.

Copper Wire: Bare, soft, fob eastern mills, c.l. 26.80 - 28.37½c; l.c.l. 27.30 - 28.87½c; weatherproof, fob eastern mills, c.l. 27.35-29.00c;; l.c.l. 27.85-29.50c; magnet, delivered, c.l. 31.13-31.50c, 15,000 lb or more 31.38-31.75c, l.c.l. 31.88-32.25c.

ALUMINUM

(Revised price schedule pending; effective June 28)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	24.0	...	...
0.135-0.126	12-48	24.5	...	...
0.125-0.096	12-48	24.5	23.1	26.3
0.095-0.077	12-48	25.0	23.2	26.5
0.076-0.061	12-48	25.5	23.4	26.7
0.060-0.048	12-48	25.7	23.6	27.0
0.047-0.038	12-48	26.1	23.8	27.3
0.037-0.030	12-48	26.4	24.1	27.7
0.029-0.024	12-48	26.8	24.4	28.1
0.023-0.019	12-36	27.4	24.8	28.6
0.018-0.017	12-36	27.9	25.3	29.3
0.016-0.015	12-36	28.6	25.9	30.1
0.014	12-24	29.4	26.6	31.1
0.013-0.012	12-24	30.2	27.3	32.0
0.011	12-24	31.1	28.1	33.1
0.010-0.0095	12-24	32.1	29.0	34.3
0.009-0.0085	12-20	33.2	30.0	35.7
0.008-0.0075	12-20	34.4	31.1	37.1
0.007	12-18	35.7	32.3	38.8
0.006	12-18	37.0	33.5	42.6

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T	17S-T	—Hexagonal— R317-T	17S-T
0.125	45.0	44.0	...	...
0.156-0.203	38.5	37.5	...	...
0.219-0.313	35.5	34.5	...	...
0.344	34.0	33.0	...	...
0.375	33.0	32.0	42.5	40.0
0.406	33.0	32.0	...	...
0.438	33.0	32.0	42.5	40.0
0.469	33.0	32.0	...	...
0.500	33.0	32.0	42.5	40.0
0.531	33.0	32.0	...	...
0.563	33.0	32.0	40.5	38.0
0.594	33.0	32.0	...	...
0.625	33.0	32.0	40.5	38.0
0.656	33.0	32.0	...	...
0.688	33.0	32.0	40.5	38.0
0.750-1.000	32.0	31.0	37.0	35.5
1.063	32.0	31.0	35.5	34.0
1.125-1.500	31.0	30.0	35.5	34.0
1.563	31.0	30.0	...	...
1.625	30.0	29.0	34.5	33.0
1.688-2.000	30.0	29.0	...	...
2.125-2.500	29.5	28.5	...	...
2.625-3.375	28.5	27.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $20.85 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $20.10 per cwt; cut coils, $20.35. Traps and Bends: List price plus 52%.

ZINC

Sheets, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 54.00c. Strip, cold-rolled 60.00c. Rods, hot-rolled 50.00c, cold-finished 55.00c. Angles, hot-rolled, 50.00c. Plates, 52.00c. Seamless tubes, 83.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 43.00c; No. 35, 41.00c. Strip, cold-rolled, 44.00c. Rods, hot-rolled 39.00c; cold-finished 44.00c. Angles, hot-rolled, 39.00c. Plates, 41.00c. Seamless tubes, 71.00c. Shot and blocks, 31.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 31.84c; oval, 31.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 44.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 25.00c; 275-lb, or 500-lb bbls. 23.00c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl. 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 10%	17.000	16.750	8.500
Phos. bronze, A	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.50, No. 2 copper 17.50, light copper 16.50, composition red brass 15.00-15.25, auto radiators 12.50-12.75, heavy yellow brass 10.75-11.00, brass pipe, 11.75-12.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.50-18.75, No. 2 copper 17.50-17.75, light copper, 16.50-16.75, refinery brass (60% copper), per dry copper content 16.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.00-17.25, No. 2 16.00-16.25, light copper 15.00-15.25, No. 1 composition red brass 13.25-13.50, No. 1 composition turnings 12.75-13.00, mixed brass turnings 7.50-7.75, new brass clippings 13.00-13.50, No. 1 brass rod turnings 10.00-10.50, light brass 6.75-7.25, heavy yellow brass 9.25-9.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 10.50-11.00, cocks and faucets 10.25-10.50, brass pipe 10.25-10.50.

Lead: Heavy 15.50-16.00, battery plates 10.00-10.50, linotype and stereotype 17.00-17.50, electrotype 15.00-15.50, mixed babbitt 14.25-14.75, solder joints, 18.75-19.25.

Zinc: Old zinc 6.25-6.75, new die cast scrap 5.25-5.75, old die cast scrap 3.25-3.75.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 12.50-13.00, old sheets 11.00-11.50, crankcases 11.00-11.50, borings and turnings 5.50-6.00, pistons, free of struts, 11.00-11.50.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June Avg.	21.500	17.325	12.000	103.00	15.058	35.000	33.750	74.625
July 1-21	21.500	17.30–17.350	12.000	103.00	15.00–16.000	35.000	33.750	74.625
July 22	21.500	17.30–17.350	12.000	103.00	15.00-16.000	35.000	40.000	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Busheling	40.00-40.50*
Nos. 1, 2 & 3 Bundles	40.00-40.50*
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	37.00-37.50
Cast Iron Borings	37.00-37.50
Bar Crops and Plate	48.00-48.50
Low Phos. Steel	48.00-49.00
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	63.00-64.00
Charging Box Cast	53.00-54.00
Heavy Breakable Cast.	56.00-58.00
Unstripped Motor Blocks	52.00-53.00
Malleable	69.00-70.00
Brake Shoe	55.50-56.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	75.00-80.00
Axles	51.50-52.00
Rails, Rerolling	56.00-58.00
Rails, Random Lengths	54.00-56.00
Rails, 3 ft and under	60.00-60.50
Rails, 18 in. and under	62.50-63.50
Railroad Specialties	55.50-56.50
Uncut Tires	52.00-52.50
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Busheling	39.50-40.00*
Nos. 1 & 2 Bundles	39.50-40.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.00-36.00
Short Shovel Turnings.	35.50-36.00
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Heavy Turnings	39.50-40.50
Alloy Free Turnings	37.50-38.50
Cut Structurals	46.00-49.00

Cast Iron Grades

No. 1 Cupola	67.00-69.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast.	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-75.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*
R.R. Malleable	73.00-75.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	60.00-61.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	51.00-53.00
Angles, Splice Bars	57.00-58.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Bundles	40.00-40.50*
Machine Shop Turnings	34.50-35.50
Short Shovel Turnings.	36.50-37.00
Cast Iron Borings	36.00-36.50
Low Phos.	46.00-47.50*

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$35.00-35.50
Short Shovel Turnings.	37.00-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	33.50
Short Shovel Turnings.	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	57.00
Charging Box Cast	45.00
Heavy Breakable Cast.	56.00
Stove Plate	50.00
Unstripped Motor Blocks	50.00
Brake Shoes	48.00
Clean Auto Cast	57.00
Drop Broken Cast	65.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50
R.R. Malleable	70.00
Rails, Rerolling	55.00
Rails, Random Lengths	54.00
Rails, 18 in. and under	61.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$37.50-38.00
No. 1 Busheling	37.50-38.00
Nos. 1 & 2 Bundles	37.50-38.00
No. 3 Bundles	37.50-38.00
Machine Shop Turning	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	32.50-33.00
Cast Iron Borings	32.50-33.00
Punchings & Plate Scrap	42.50-43.00

Cast Iron Grades

No. 1 Cupola Cast	53.00-58.00
Heavy Breakable Cast.	47.00-52.00
Clean Auto Cast	53.00-58.00

BUFFALO

No. 1 Heavy Melt. Steel	$43.00-45.00
No. 2 Heavy Melt. Steel	39.75-40.25
No. 1 Busheling	39.75-40.25
No. 1 & 2 Bundles	39.75-40.25
Machine Shop Turnings	34.75-35.25
Mixed Borings, Turnings	34.75-35.25
Cast Iron Borings	35.50-36.00
Short Shovel Turnings.	35.50-36.00
Low Phos.	44.75-45.25

Cast Iron Grades

No. 1 Cupola	60.00-62.00
Mixed Cupola	55.00-60.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under.	60.00-61.00
Railroad Specialties	51.00-53.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$42.50-43.50
No. 2 Heavy Melt. Steel	41.50
No. 1 Busheling	41.50
Nos. 1 & 2 Bundles	41.50
No. 3 Bundles	39.50
Machine Shop Turnings	35.00
Mixed Borings, Turnings	35.00
Short Shovel Turnings.	35.00
Bar Crop and Plate	49.00-50.00
Punchings & Plate Scrap	49.00-50.00
Cut Structurals	47.50-48.00
Elec. Furnace Bundles.	45.00
Heavy Turnings	43.00-43.50
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast.	67.00-68.00
Charging Box Cast	63.00-64.00
Heavy Breakable Cast.	63.00-64.00
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$36.50-37.00
No. 2 Heavy Melt. Steel	34.50
No. 1 Busheling	34.50
Nos. 1 & 2 Bundles	34.50
No. 3 Bundles	32.50
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	30.50-31.00
Punchings & Plate Scrap	40.00-41.00
Cut Structurals	40.00-41.00
Elec. Furnace Bundles.	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-57.00
Charging Box Cast	56.00-58.00
Heavy Breakable	56.00-58.00
Unstripped Motor Blocks	52.50-53.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.90
No. 2 Heavy Melt. Steel	31.90
No. 1 Bundles	31.90
No. 1 Busheling	31.90
Machine Shop Turnings	28.90-30.00
Mixed Borings, Turnings	28.90-30.00
Short Shovel Turnings.	28.90
Bar Crops and Plate	35.00-37.00
Punchings & Plate Scrap	35.00-37.00
Chemical Borings	37.00-37.50

Cast Iron Grades

No. 1 Cupola Cast	50.00-52.00
Heavy Breakable Cast.	53.00
Stove Plate	50.00
Unstripped Motor Blocks	48.00
Clean Auto Cast	50.00-52.00

CHICAGO

No. 1 Heavy Melt. Steel	$41.50-42.00
No. 2 Heavy Melt. Steel	41.50-42.00
No. 1 Bundles	41.50-42.00
No. 2 Bundles	41.50-42.00
No. 3 Bundles	39.50-40.00
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	38.50-39.00
Cast Iron Borings	37.50-38.00
Bar Crops and Plate	47.00-48.00
Punchings	48.00-49.00
Elec. Furnace Bundles.	42.50-43.00
Heavy Turnings	41.00-41.50
Cut Structurals	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	67.00-70.00
Clean Auto Cast	67.00-70.00
No. 1 Wheels	61.00-62.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	46.00-48.00
Malleable	77.00-78.00
Rails, Rerolling	59.00-61.00
Rails, Random Lengths	54.00-55.00
Rails, 3 ft and under	57.00-58.00
Rails, 18 in. and under	59.00-60.00
Railroad Specialties	54.00-55.00
Angles, Splice Bars	55.00-56.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$43.00-43.50
No. 2 Heavy Melt. Steel	40.00-40.50
Machine Shop Turnings	32.50-33.50
Short Shovel Turnings.	34.50-35.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	56.00-58.00
Heavy Breakable Cast.	59.00-60.00
Brake Shoes	58.00-59.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R.R. Malleable	69.00-70.00
Rails, Rerolling	57.00-60.00
Rails, Random Lengths	50.00-51.00
Rails, 3 ft and under	58.00-60.00
Uncut Tires	49.00-50.00
Angles, Splice Bars	50.00-52.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.50
No. 2 Heavy Melt. Steel	37.50
No. 1 Busheling	37.50
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*19.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	19.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	26.00
No. 1 Busheling	26.00
Nos. 1 & 2 Bundles	22.00-23.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings	19.00-21.00
Mixed Borings, Turnings	19.00-21.00
Punchings & Plate Scrap	26.00-28.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Heavy Breakable Cast.	35.00
Stove Plate	30.00
Unstripped Motor Blocks	32.50
Malleable	40.00
Brake Shoes	35.00
Clean Auto Cast	40.00
No. 1 Wheels	35.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

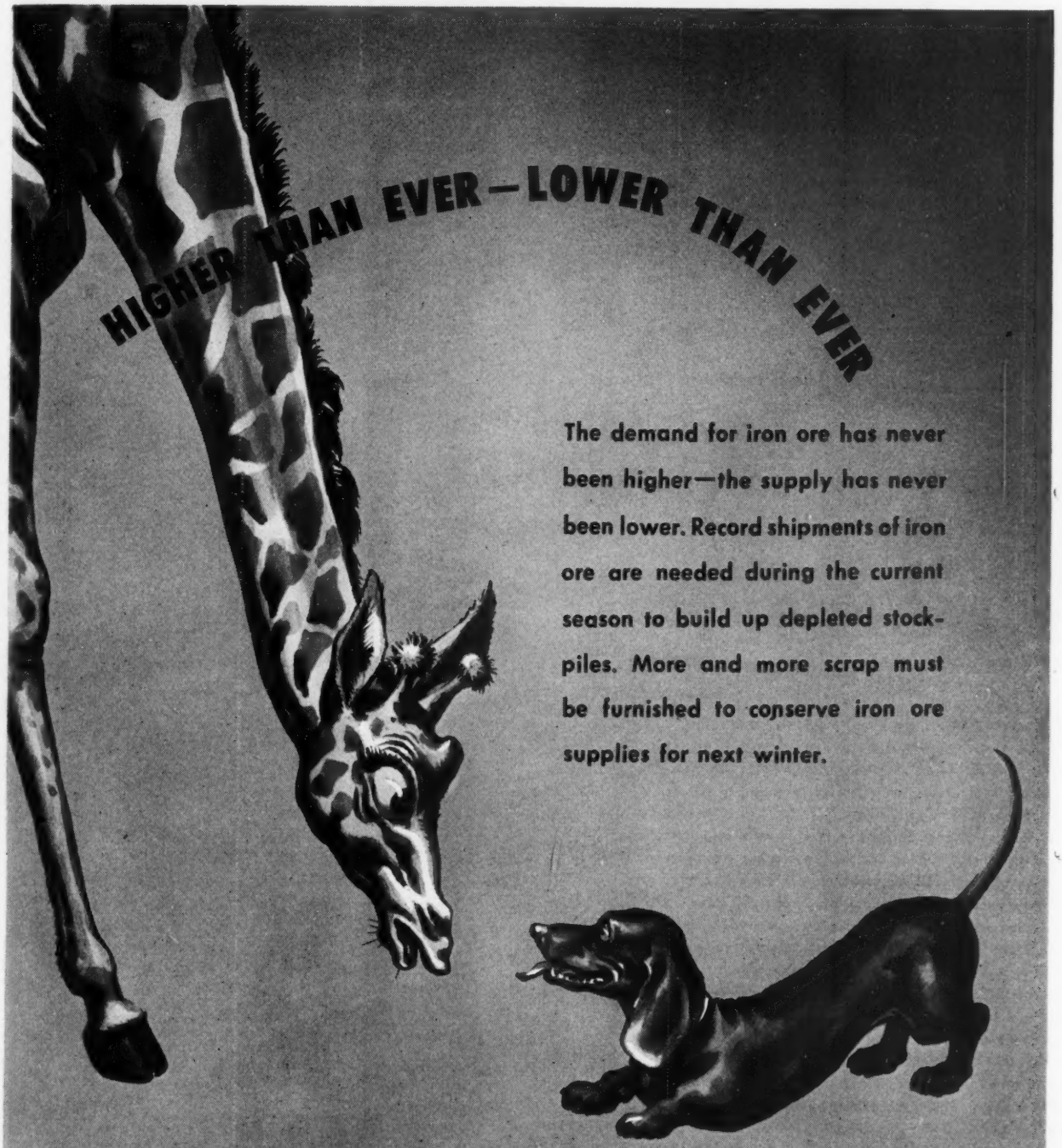
(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.



The demand for iron ore has never been higher—the supply has never been lower. Record shipments of iron ore are needed during the current season to build up depleted stockpiles. More and more scrap must be furnished to conserve iron ore supplies for next winter.

CONSULT OUR NEAREST OFFICE FOR THE SALE OR PURCHASE OF SCRAP

LURIA BROTHERS & COMPANY, INC.

Main Office
LINCOLN-LIBERTY BLDG.
PHILADELPHIA 7, PENNSYLVANIA

Yards
LEBANON, PA. • READING, PA.
DETROIT (ECORSE), MICH
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BUFFALO, N. Y. Genesee Bldg.
CHICAGO, ILL. 100 W. Monroe St.
CLEVELAND, O. 1022 Midland Bldg.
DETROIT, MICH. 2011 Book Bldg.
HOUSTON, TEXAS Cotton Exchange
LEBANON, PA. Luria Bldg.
NEW YORK, N. Y. Woolworth Bldg.
PITTSBURGH, PA. Oliver Bldg.
PUEBLO, COLO. Colorado Bldg.
READING, PA. Luria Bldg.
ST. LOUIS, MO. 2110 Railway Exchange Bldg.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

U. S. Steel Advances Prices

Mill price schedules issued by subsidiaries of the corporation incorporate advances up to $17 a ton. Average increase is about $9.34 a ton, or about 9.6 per cent

Pittsburgh—Due to constantly rising costs, steel-producing subsidiaries of the United States Steel Corp. increased their prices for steel products last week, effective as of July 16. The corporation announced that the new prices at mills or shipping points embrace a restoration of the average price reduction of about $1.25 a ton made last April and, in addition, include an average increase of about $8.09 a ton, or about 9.6 per cent, in the base prices for major steel products.

The following price schedules apply, as usual, to products within the range of sizes, grades, finishes and specifications produced and are subject to seller's current list of extras and deductions and standard conditions of sale. All sales are subject to seller's price in effect at time of shipment. Delivered prices reflecting actual transportation charges to destination also will be quoted to customers.

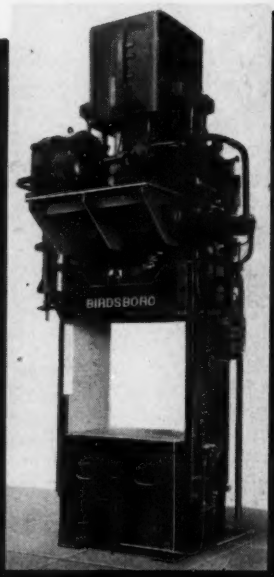
ROSS

Mass-Produced, Standardized "BCF" EXCHANGERS are factory furnished accessories on Birdsboro Presses, too!

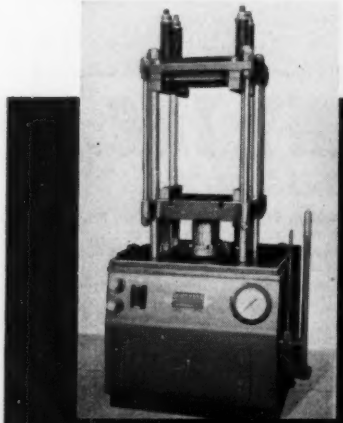
Birdsboro Steel Foundry and Machine Co., Birdsboro, Pa., like numerous other manufacturers of primary equipment, finds the Ross "BCF" Exchanger ideal for incorporating in its presses as a factory-furnished hydraulic oil cooler...

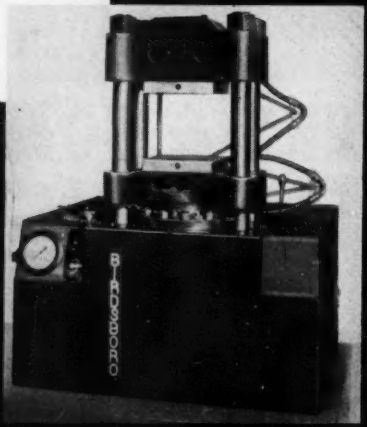
...ideal not only because it represents the highest standards of construction and the greatest improvements in thermal design, but ideal because it is standardized, mass-produced and continually available from stock.

To any industry requiring heat transfer equipment (either for its own use or for resale) to do a cooling, heating or condensing job with liquids, vapors and gases, the new Ross "BCF" Exchanger offers unmatched performance and cost advantages. *Familiarize yourself with them by requesting the new "BCF" Bulletin 1.1K1 to be released shortly.* Ross Heater & Mfg. Co., Inc., Division of American Radiator & Standard Sanitary Corp., 1431 West Ave., Buffalo 13, N. Y. Represented in Canada by Horton Steel Works, Ltd., Fort Erie, Ont.



Birdsboro 150-ton single action metal drawing press


Birdsboro 25-ton plastic compression molding press



Birdsboro 140-ton plastic laminating laboratory press

CARNEGIE-ILLINOIS STEEL CORP.

Carbon Steel

	(Per Net Ton)	(Inc.)
Ingots (forging quality)	$50.00	4.00
Blooms, billets & slabs (forging quality)	61.00	7.00
Blooms, billets & slabs (rerolling quality)	52.00	7.00
	(Cents per Lb)	
Skelp	3.25	0.35
Bars and bar shapes	3.35	0.50
Hoop (tight cooperage)	3.60	0.50
Floor plates	4.55	0.50
Plates	3.40	0.50
CB sections	3.20	0.50
Standard structurals	3.25	0.50
Reinforcing bars (new billet)	3.35	0.65
Bearing piles (CBP sections)	3.20	0.50
Sheet piling	4.05	0.75
Standard tee rails:		
No. 1 O.H.	3.20	0.50
No. 2 O.H.	3.10	0.50
All No. 2 O.H.	3.15	0.50
Light rails	3.55	0.50
Joint bars for standard rails	4.25	0.50
Tie plates	4.05	0.50
Axles	5.20	0.75
Strip, hot rolled	3.25	0.50
Sheets:		
Hot-rolled, 18 ga. & hvr.	3.25	0.50
Cold-rolled, commercial quality	4.00	0.55
Electric (electrical grade)	5.95	0.75
Galvanized	4.40	0.55
Galv. flat culvert—copper steel	5.00	0.55
Galvannealed	4.95	0.55
Long terne, commercial quality	4.80	0.75
Vitrenamel	4.40	0.55
Holloware enameling black plate	4.75	0.10
	(Per Pkg.)	
Roofing, short ternes 8 lb. coated	$15.50	0.20

High Strength Steel

Corten

	(Cents per Lb)	(Inc.)
Bars & small shapes	5.10	0.75
Plates	5.20	0.75
C.B. sections	4.95	0.75
Standard structurals	4.95	0.75
Strip, hot-rolled	4.95	0.75
Sheets:		
Hot-rolled	4.95	0.75
Cold-rolled	6.05	0.85
Galvanized	6.75	0.85

Man-Ten

Bars and small shapes	4.15	0.50
Plates	4.45	0.50
C.B. sections	4.20	0.50
Standard structurals	4.20	0.50
Strip, hot-rolled	4.10	0.50
Sheets, hot-rolled	4.10	0.50

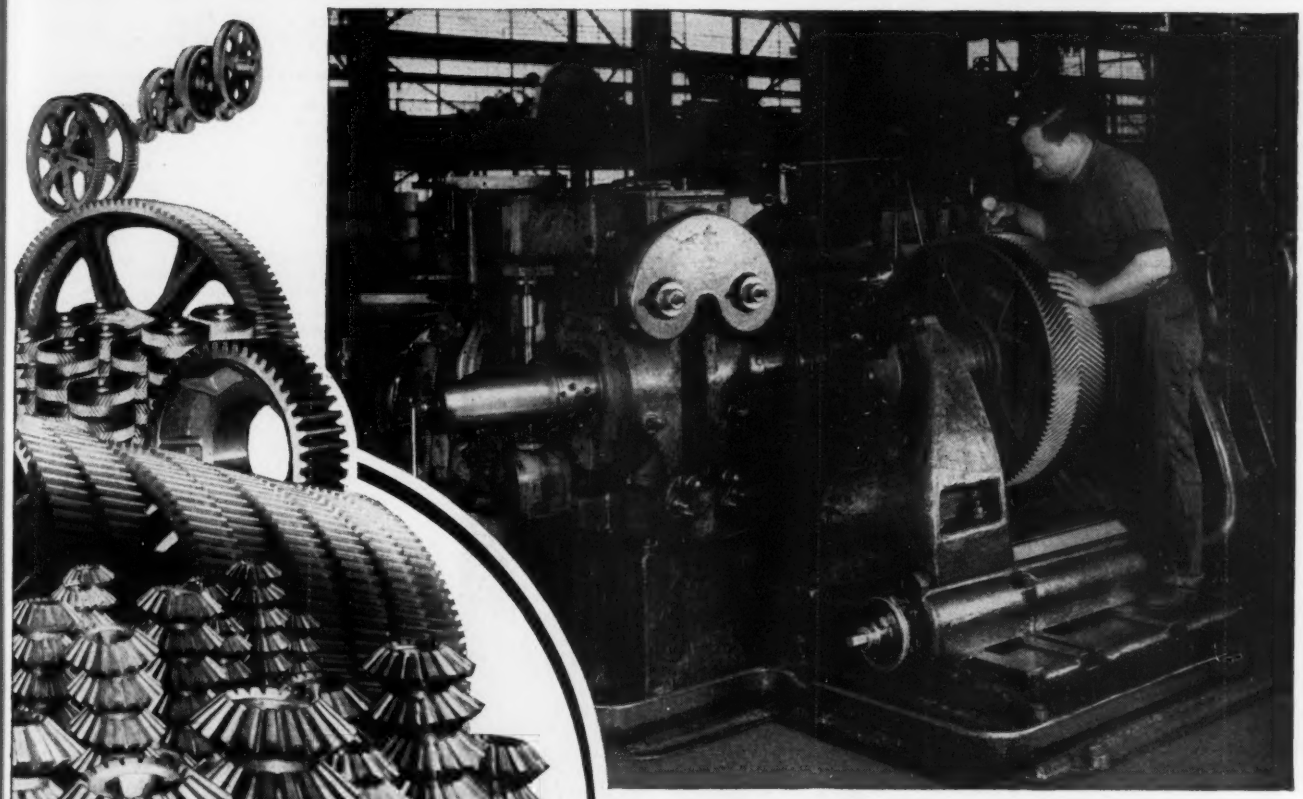
Abrasion Resisting

Plates	4.55	0.50
Bars & Bar shapes	4.50	0.70
Sheets, hot-rolled	4.40	0.50
Strip, hot-rolled	4.40	0.50

Alloy

	(Per Net Ton)	(Inc. per Net Ton)
Ingots	$51.00	1.00
Blooms, billets & slabs	63.00	4.00
	(Cents per Lb)	(Inc.)
Hot-rolled bars	3.75	0.55
Bar shapes	4.00	0.55
Plates	4.40	0.70
Structural shapes	4.05	0.60
Strip, hot-rolled	5.10	0.50

Pending clarification of selling methods, the only change currently made in the pricing of tin plate is to advance the price to the level prevailing on Apr. 30, when a reduction of 10 cents a box was made. Prices for other prod-



GEARS of Neloy (OR NELOY MOLY) THE Preference of INDUSTRY

(NE) is the symbol of quality recognized by users of industrial gears everywhere. Our Foundries specialize in Gear Blank Castings of Alloy and Carbon Steel. The facilities of the National-Erie Corporation at your command, permit complete control from raw material to the finish machined gears. Spur, bevel and Sykes Herringbone of Neloy (or Neloy Moly) meet with outstanding success in industry because they are giving excellent service in many varied applications.

First and final costs of Neloy (or Neloy Moly) gears are reasonable. The (NE) Flame Hardening Process combines the high surface hardness of carburized or case hardened treatment, combined with the toughness of a fully quenched medium carbon alloy steel.

Neloy (or Neloy Moly) is the Ideal alloy steel for gears . . . the Preference of Industry. Let us help you meet your gear requirements.

Write for bulletin No. 9.

NATIONAL ERIE CORPORATION

ERIE, PENNSYLVANIA • U. S. A.

AJAX
FLEXIBLE
COUPLINGS
The fact that all the horsepower goes through the coupling emphasizes the importance of protecting direct-connected machines against misalignment.
AJAX FLEXIBLE COUPLING CO. INC., WESTFIELD, N. Y.

ucts sold by Carnegie-Illinois but not listed above will be quoted upon application.

AMERICAN STEEL & WIRE CO.

	(Per 100 Lb)	(Inc.)
Wire rods, carbon:		
Donora, Cleve., Joliet	3.40	0.60
Worcester	3.70	0.60
Strip, C. R. carbon:		
Cleveland	4.00	0.55
New Haven	4.50	0.55
Wire, mirs. bright, low-carbon:		
Donora, Cleve., Joliet, Waukegan, Duluth, Rankin	4.15	0.70
Worcester	4.45	0.70
Wire, spring, high-carbon:		
Donora, Cleve., Duluth, Waukegan	5.20	0.70
Worcester, Trenton, New Haven	5.50	0.70
Wire, flat:		
Cleveland	5.00	0.55
Worcester	5.30	0.55

Wire, merchant quality:	Annealed Gal.	(Inc.)
Donora, Cleve., Joliet, Rankin, Duluth 4.80	5.25	0.70
Worcester 5.10	5.55	0.70

	(Col.)	(Inc.)
Wire, Barbed:		
Donora, Rankin, Joliet, Duluth	123	12
Nails and Staples:		
Donora, Joliet, Rankin, Duluth	103	12
Worcester	109	12
Woven Fence:		
Donora, Joliet, Rankin, Duluth	109	12
Bale Ties:		
Donora, Joliet, Duluth	106	12
Fence Posts: Duluth	114	10

TENNESSEE COAL, IRON & RAILROAD CO.

Billets, blooms and slabs	(Per Net Ton)	(Inc.)
Rerolling	$52.00	7.00
Forging	61.00	7.00
	(Cents per Lb)	
Wire rods	3.40	0.60
Sheets		
Hot-rolled (18 Ga. & hvr.)	3.25	0.50
Hot-rolled annealed (19 Ga. & lgtr.)	4.15	0.50
Cold-reduced	4.00	0.55
Galvanized	4.40	0.55
Hot-rolled strip	3.25	0.50
Bars and small shapes	3.35	0.50
Reinforcing bars	3.35	0.65
Special steel	9.50	0.00
Plates, carbon	3.40	0.50
Standard structurals	3.25	0.50
Standard rails	3.20	0.50
Light rails	3.55	0.50
Splice bars	4.25	0.50
Tie plates	4.05	0.50
Track spikes	5.35	0.50
Axles	5.20	0.75
Track bolts	7.50	0.50
Cor-Ten		
Hot-rolled sheets	4.95	0.75
Hot-rolled strip	4.95	0.75
Bars and small shapes	5.10	0.75
Plates	5.20	0.75
Standard structural shapes	4.95	0.75
Wire		
Bright low-carbon	4.15	0.70
Merchant quality:		
Annealed	4.80	0.70
Galvanized	5.25	0.70
	(Col.)	(Inc.)
Nails and staples	103	12
Barbed wire	123	12
Woven fence	109	12
Bale ties	106	12

COLUMBIA STEEL CO.

	(Cents per Lb)	(Inc.)
Structural shapes	3.85	0.50
Tie plates	4.20	0.50
Bars:		
Hot-rolled	4.05	0.50
Concrete reinforcing	4.05	0.75
Sheets:		
Hot-rolled (18 Ga. & hvr.)	3.95	0.50

Hot-rolled annealed (19 Ga. & lgtr.)	5.05	0.50
Hot-rolled drum	3.95	0.50
Galvanized	5.15	0.55
Galvanized culvert	5.75	0.55
Well casing	4.75	0.50
Hot-rolled strip	4.00	0.50
Hot-rolled rods	4.05	0.60
Non-stand. nails and staples	6.20	0.60
Wire:		
Annealed, merchant	5.75	0.70
Galvanized, merchant	6.20	0.70
Bright basic	5.10	0.70
Annealed stone	9.40	0.70
Galvanized stone	10.90	0.70
MB spring	6.50	0.70
Columbia spring	6.15	0.70
Bright stapling	8.05	0.70
Tire Bead	11.00	0.70
	(Col.)	(Inc.)
Barbed & twisted	143	12
Gal. woven wire fence	132	12
Single loop bale ties	130	12
Stand. nails and staples	123	11

NATIONAL TUBE CO.

National Tube Co. announced the following advances in mill prices:

Butt-Weld:	(Inc. per Net Ton)
Standard and line pipe, ½" to 3"	$10
Seamless:	
Standard and line pipe	10
Casing, all grades	10
Oil well tubing, Grades H-40, J-55	11
Oil well tubing, Grade N-80	15
Drill pipe	8

Seamless mechanical and pressure tubing prices will be adjusted proportionately.

STEEL EXPORT

New York — United States Steel Export Co. has announced the following new prices covering principal carbon and alloy steel products with freight included to New York, Philadelphia or Baltimore. These prices apply on carload lots and became effective with shipments on and after July 21. The new schedule follows:

Carbon	
Ingots:	Per net ton
Re-rolling quality	$64.13
Forging quality	65.13
Billets, Blooms and Slabs:	
Re-rolling quality	67.13
Forging quality	76.13
Tube Rounds	91.13
Rails:	
Standard, 61 lb and over	81.28
Light, 60 lb and under	85.99
	Per 100 lb
Skelp	$4.09
Standard Structural Shapes	4.07
C.B. Sections and Bearing Piles	4.02
Plain Plates	4.22
Floor Plates	5.37
Hot-Rolled Bars	4.19
Concrete Reinforcing Bars	4.19
Steel Sheet Piling	4.87
Hot-Rolled Strip	4.09
Joint Bars for Standard Rails	5.49
Tie Plates	5.49
Axles	6.02
Sheets:	
H. R., 18 Ga. & heavier	4.07
C. R., 15 Ga.	4.82
Galvanized, plain 10 Ga.	5.22
Galvanized, corrugated, 10 Ga.	5.32
Vitrenamel, 12 Ga.	5.22
Electrical (electrical grade)	6.77
Long Ternes, 10 Ga.	5.62
Tin Plate 107#:	Per Base Box
American Coke, 1.25 lb coating	$7.95
American Coke, 1.50 lb coating	8.15
Ferrostan—unassorted:	
0.25 lb coating	7.15
0.50 lb coating	7.35
0.75 lb coating	7.55

Is Your Plant as Modern as Your Product?

Step Up Productive Output with TOWMOTOR MH*

Overcome the handicap of obsolete handling methods—let Towmotor Mass Handling help you increase productive output in your plant. Versatile, gasoline-powered Towmotor Fork Lift Trucks and Towmotor Accessories provide all the benefits of modern handling techniques for every plant, large or small . . . handling raw materials and finished products of every size, shape and type . . . 24 hours a day. Turn to Towmotor for the solution to your handling problem. Follow the lead of the men who have to make handling pay a profit. More *professional handlers* use Towmotor than any other fork lift truck.

If your handling problems cannot be solved with a standard Towmotor unit, our engineers will analyze your procedures, design special equipment necessary to meet your specific needs. Details available without obligation.

**M H is Mass Handling, the systematic movement of the most units, in the shortest time, at the lowest cost.*

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Lyman, 4 pt. 5 in.	$6.19
Glidden, 2 pt. 4 in.	5.68

		Per net ton
American Standard Pipe, T & C:	Black	Gal.
Buttweld, 2½ & 3 in.....	$116.20	$148.20
Seamless, 3½ to 6 in. ...	130.20	163.20
English Gas Tubes, T & C:		
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	Per net ton
Ingots: Forging quality	$66.13
Billets, Blooms, Slabs:	
Forging quality	78.13
	Per 100 lb
Bars, hot-rolled	$4.57
Plates	5.22
Standard Structural Shapes	4.87
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Plates	$6.02	$5.27	$5.37
Structural Shapes	5.77	5.02	...
C.B. Sections	5.77	5.02	...
Sheets, hot-rolled	5.77	4.92	5.22
Sheets, cold-rolled	6.87	...	...
Sheets, galvanized	7.57	...	...
H.R. Bars & Bar Shapes.	5.92	4.97	5.32

Great Lakes Raises Prices

Great Lakes Steel Corp. announced the following new mill prices: Hot-rolled sheet and strip, 3.45c per lb; plates 3.65c, bars 3.55c. All are up $9 a ton.

Cold-rolled sheet and strip are 4.20c and vitreous enameling sheets 4.70c, all up $11 a ton.

NAX hot-rolled sheet and strip are quoted at 5.25c, plates at 5.65c, bars at 5.40c, all up $15 a ton, and cold-rolled sheet and strip at 6.35c, up $17 a ton.

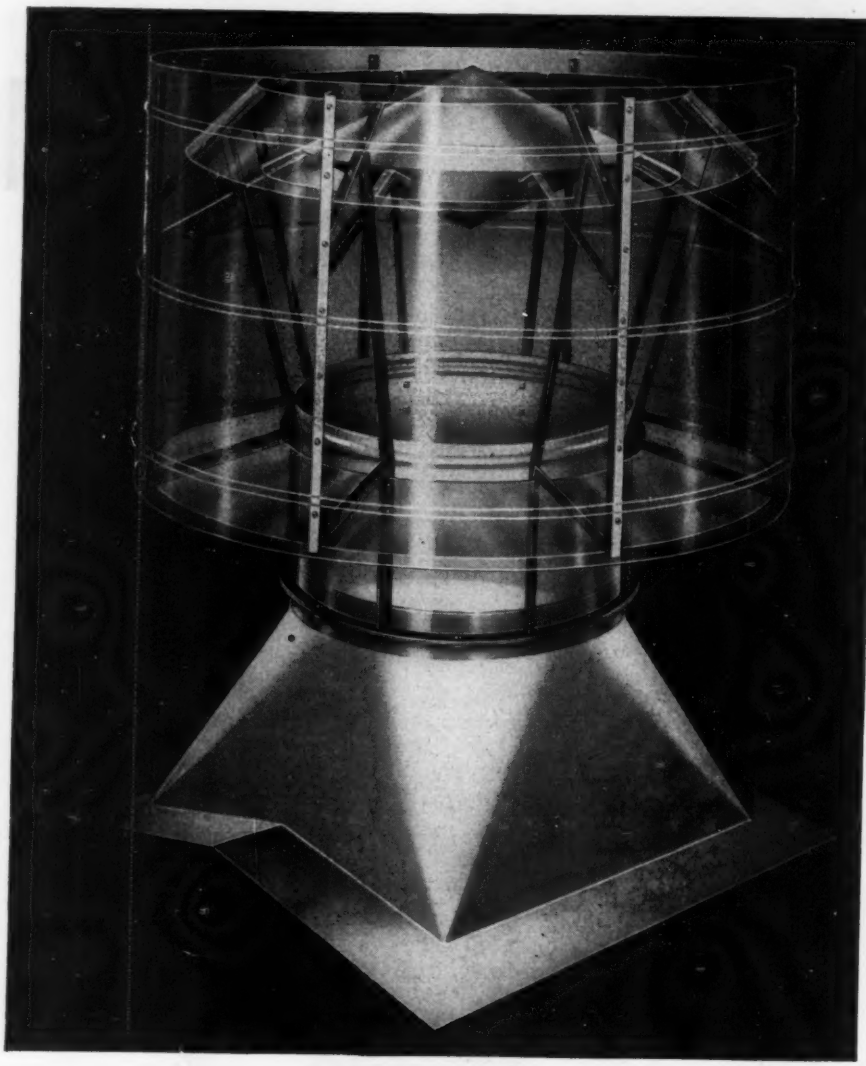
J&L's Prices Advanced July 22

Jones & Laughlin Steel Corp. last week yielded to the pressures of higher materials costs, freight rates on incoming shipments, and wage increases to the coal miners and the steelworkers and established new price schedules. In making its adjustments the company began quoting on an f.o.b. mill basis.

The new prices which went into effect July 22 rescind the reductions made by the company May 5 and also make substantial upward adjustments, amounting, for example, on some classes of pipe and tubing to between $8 and $14 per net ton.

Inland Steel Raises Prices

Chicago — Inland Steel Co. announced last week a mill pricing basis at Indiana Harbor and higher prices on shipments on and after July 23. New mill prices were identical with those posted by Carnegie-Illi-



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nois on products made by both. Among products listed by Inland only are: Cold-rolled strip, $4.00 per 100 lb; tube rounds, $76; track spikes, $5.35; coke in plate, $4.75 per base box.

Pig iron prices advanced $4 to $42.50, basic, and $43.50, malleable. Announcement states that if materieal is required f.o.b. boat or barge at works Indiana Harbor an additional charge of 5 cents per hundred for loading will apply.

Bethlehem's Quotations Up

Philadelphia — Bethlehem Steel Co. has advanced hot-rolled carbon sheets $10 a ton, now quoting, 72 inches and narrower, 3.30c Lackawanna, and 60 inches and narrower, 3.30c Sparrows Point. Cold-rolled carbon sheets have been advanced $11 a ton, with 11 gage and thinner and 72 inches and narrower, now being quoted at 4.10c Lackawanna, and 14 gage and thinner, 48 inches and narrower, 4.10c, Sparrows Point. Galvanized sheets, 10 gage, 48 inches and narrower, have been increased $11 to 4.50c, Sparrows Point, also galvanized culvert, 16 gage, to 5.15c Sparrows Point.

Hot-rolled strip, produced on sheet mill, has been increased by Bethlehem $10 a ton to 3.30c, Lackawanna and Sparrows Point; cold-rolled strip, produced on sheet mill, $11 a ton to 4.10c, Lackawanna and Sparrows Point.

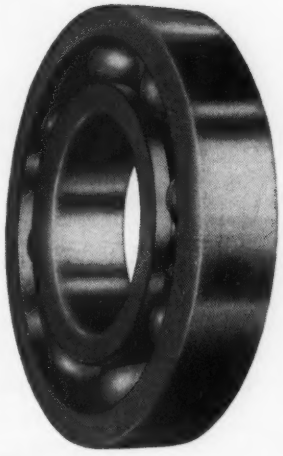
Armco Raises Prices

Armco Steel Corp. announced the following new mill prices: Steel hot-rolled bars, 3.35c per lb; ingot iron hot-rolled bars, 3.60c; steel plates, 3.40c; ingot iron plates, carlots, 3.65c; lcl, 4.15c; steel hot-rolled sheets, 3.25c; ingot iron hot-rolled sheets, 3.50c; steel hot-rolled strip, 3.25c; ingot iron hot-rolled strip, 3.50c; steel cold-rolled sheets, 4.00c; ingot iron cold-rolled sheets, 4.50c; steel cold-rolled paintgrip sheets, 4.95c; ingot iron cold-rolled paintgrip sheets, 5.45c; steel cold-rolled strip, 4.00c; enameling iron sheets, 4.40c; electric cold-rolled sheets, 6.20c; electric hot-rolled, 5.95c; steel long ternes, 4.80c; ingot iron long ternes, 5.20c; steel galvanized sheets, 4.40c; ingot iron galvanized sheets, 4.65c; ingot iron galvanized paintgrip sheets, 5.05c; steel zincgrip sheets, 4.65c; ingot iron zincgrip sheets, 4.90c; steel zincgrip paintgrip sheets 5.05c; ingot iron zincgrip, paintgrip sheets, 5.30c; aluminized sheets, 7.75c.

Sheets, Strip . . .

Sheet Prices, Page 124

New York — While the switch to the f.o.b. mill or shipping point system of quoting will undoubtedly accelerate the withdrawal of certain midwestern mills from the eastern seaboard, it should have little or no effect on third quarter quotas. Mills have definitely committed themselves to filling these quotas to the best of their ability and are likely to stand by these commitments. However, the disposition of some mills to hasten



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their withdrawal on practically all grades, excepting possibly specialties, will undoubtedly be reflected when the time comes for setting up fourth quarter quotas, although possibly modified to some extent by what future action may be taken with respect to further setting up of priority allocations, whether voluntary or mandatory.

The latest allocation program, proposed for voluntary action, involves 1,269,000 tons of steel for shipment in the next 12 months for defense production, with 25 per cent of the total said to be comprised of sheets and strip. This may follow the three voluntary allocation programs already set up within the industry, namely, the freight car program (requiring approximately 3 million tons a year), warm air heating industry (requirements scheduled to take 233,000 tons over an eight month period beginning this month), and the atomic energy program (involving 160,000 tons for allocation during the same 8-month period).

Boston—Advance in cold-rolled carbon strip to 4.50c, New Haven, Conn., represents an increase of $11 ton. With the Cleveland mill price 4.00c, New England mill differential is $10 a ton compared with $6 a ton for flat wire and other wire products quoted at Worcester. Hot strip is up $10 a ton at Pittsburgh, 3.25c mill, and delivered Boston price is 3.92c. This is more than some cold strip producers have been charging on a Worcester base. Sharp increase in mill prices by nonintegrated producers of cold strip in inevitable.

Pittsburgh — Extent to which independent sheetmakers will follow the action of U. S. Steel subsidiaries in raising prices on sheets and strip was uncertain last week. Some of the smaller makers have been quoting premium prices and they may only advance their prices sufficiently to match those of the U. S. Steel subsidiaries.

All sheetmakers have not yet adopted the mill pricing basis. However, the matter is under study and indications are sales practices will be adjusted to the new basis when studies are completed. In most instances, it is expected the producers will issue a dual announcement incorporating not only the shift to mill pricing but also higher prices.

It is not likely the sharp increase in prices will affect demand adversely in view of the current tight supply situation. New developments demandwise threaten to intensify the supply pinch sufficiently to put added spur behind ordinary demand. Last week the steel industry approved voluntary allocation of some 1,250,000 tons of steel to government defense contractors for arms production over the next 12 months.

Carnegie-Illinois announced the following mill prices for silicon sheets: armature, 5.45c; electrical, 5.95c; motor, 6.70c; dynamo, 7.50c; transformer: 72, 8.05c; 65, 8.65c; 58. 9.30c; and 52, 10.10c.

Chicago — Consumers of flat-rolled products have cause for worry in the sharply increased cost of material forced upon them in a very short period of time. Consumers who have been obtaining their requirements from remote mills must pay not ony higher mill prices but substantial amounts in delivery charges. Most metalworking manufacturers will be obliged to increase prices of their products. Availability of steel remains predominant over price and pressure for tonnage persists.

Birmingham — District sheet users are hoping, if not actually expecting, some increased allocations as a result of the new pricing system. There is no evidence thus far of any such development, however, since availability seems to be of much greater importance than price. Demand continues as great as ever with little likelihood of any real improvement before the first quarter, at least.

St. Louis — Sheet steel consumers here are awaiting results of f.o.b. mill pricing and the decision of local producers on steel price increases. An announcement on the latter was expected late last week. The change to the mill basis is expected to make no great change, however, for the reason consumers of St. Louis-made steel generally are nearby. Granite City Steel Co., for example, estimates freight absorption on the great majority of its customers has been less than 25 cents a ton for many years. Granite City Steel continues to have adjustment difficulties in auxiliary equipment in its new cold finishing mill. Operation rate continues at about 40 per cent. Books will reman closed until ultimate performance can be better determined.

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Steel Bars . . .

Bar Prices, Page 124

Cleveland—American Steel & Wire Co. has advanced cold-finished carbon bars $11 a ton to the basis of 4.00c, Donora, Cleveland and Waukegan mills; cold-finished alloy bars, $13 a ton, to 4.65c Waukegan, Cleveland, and Donora mills, and 4.95c Worcester mill.

Plates . . .

Plate Prices, Page 125

Philadelphia—District plate market is featured by several changes, with Bethlehem Steel Co. advancing carbon plates, sheared and universal, 10 inches and over in width, to 3.45c, Sparrows Point. Md., and Johnstown, Pa., and continuous mill plate to 3.45c, Lackawanna, N. Y., an increase of $10 per ton. Hot-rolled Mayari alloy plate, sheared and universal, 10 inches and over, has been increased to 5.30c, Sparrows Point and Johnstown, up $15 a ton.

Worth Steel Co., Claymont, Del., advanced carbon steel plates $6 a ton to 3.95c base, Claymont; also on steel entering into flanged or flanged and dished heads or other flange shops products formed by the company, Claymont is quoting 3.75c.

Central Iron & Steel Co., Harrisburg, Pa., has established a new price on carbon plates of 5.85c, fob Harrisburg. This compares with previous price of 5.10c, basing points.

New York — Upward swing of plate prices has had little or no overall bearing on pressure for tonnage. Undoubtedly some fabrication work will be held up pending at least a refiguring of costs, but for every ton on which there might be a delay in specification, there is demand waiting to take up the slack and, in fact, take all the tonnage that the mills can turn out. This is especially true with military and other urgent requirements looming just ahead.

Price advances were led off last week by a $6 a ton increase on carbon and alloy steel plates by the Lukens Steel Co., Coatesville, Pa., effective July 19. The new prices were 3.75c for carbon and 5.10c for alloy steel plates, both f.o.b. Coatesville.

Boston—Carbon plates rolled at Pittsburgh are now 4.07c, delivered Boston, an increase of $10 ton. Floor plate is also $10 a ton higher at 5.22c. With the Sparrows Point mill price 3.45c on carbon plates, delivered Boston price would be 4.01c. Net effect of the changeover is to further broaden and mix prices with premium quotations playing a part.

Birmingham — Plate users are caught short in most instances even though production remains substantially at capacity in the South. Tank production and allocations, a big part of which is to take care of railroad car building, account for considerable plate tonnage. Floor plates are reported in somewhat better supply.

Seattle — Shortages of plates are a serious handicap, plants restricting bidding to materials in stock or available. The new pricing policy is an added headache. Plant operations are fair, mostly small jobs involving less than 100 tons each.

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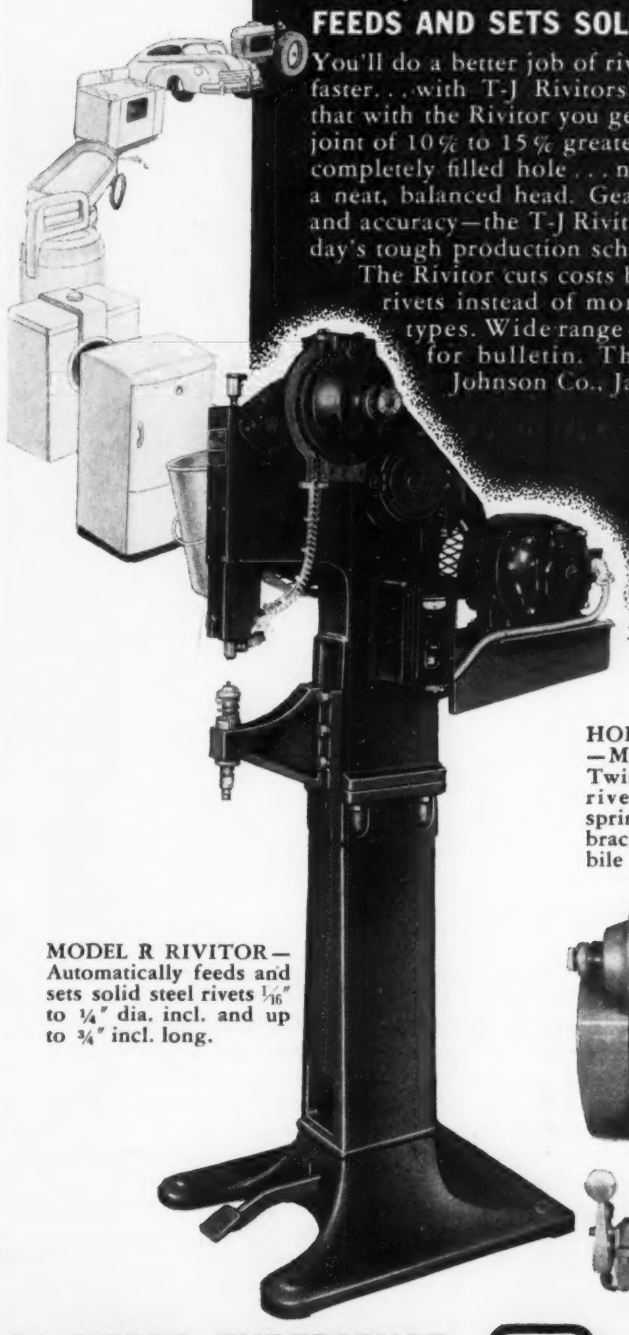

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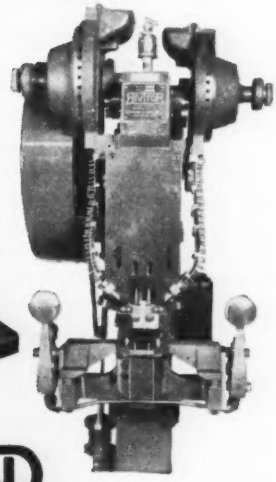

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Acme Strip Prices Advance

Chicago — Acme Steel Co. has announced the following prices on strip steel, effective on shipments July 21, fob mill Riverdale, Ill.: Hot-rolled $3.30 per 100 lb; cold-rolled, $4.25. Former prices were $2.80 and $3.65, respectively.

Wire . . .

Wire Prices, Page 125

Boston—With the $6 Worcester differential generally retained, the increase in finished wire prices is higher than for most products, ranging up to $14 a ton. Rods are $12 a ton higher at 3.70c Worcester. Manufacturers' bright low-carbon stock at 4.45c Worcester is $14 a ton higher, while high-carbon spring wire advanced a like amount to 5.50c Worcester, New Haven and Trenton. Increase in flat wire by American Steel & Wire Co. is $11 ton, 5.30c Worcester. Merchant quality wire is $14 higher, both annealed and galvanized, former is 5.10c Worcester and galvanized 5.55c Worcester.

Chicago — Demand for manufacturers' wire and most merchant items is in excess of supply, and there is no indication that balance will be achieved soon.

Birmingham—The scarcity of most wire products remains marked in this territory. Wire processors are unable, as usual, to get sufficient supplies to maintain production.

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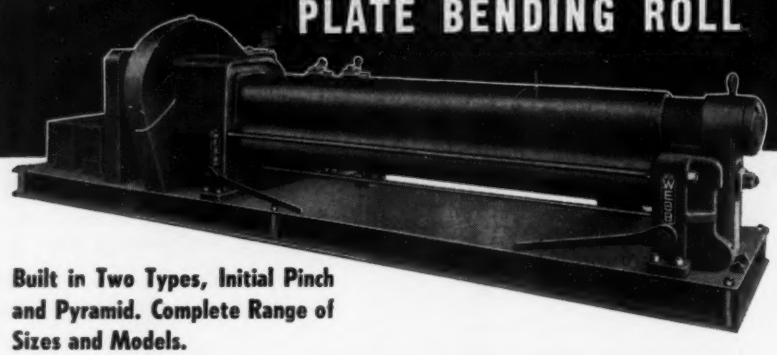

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Tin Plate . . .

Tin Plate Prices, Page 125

Pittsburgh — An unusual situation prevails in the tin plate market at the moment in that U.S. Steel Corp. subsidiaries have not yet acted to place this product on a mill basis, but the shift on this product is only a matter of time, hinging upon clarification of certain problems peculiar to this market.

To what extent long-term contracts with the canmakers is a factor for deferment of the pricing shift is not clear. It is pointed out, however, that cans also are sold on a basis that presumably is banned by the Supreme Court decision in the Cement case, and adjustments may necessitate some changes in tin plate contracts with the steel producers.

While tin plate contracts in most instances of the larger consumers are made for the year, it is said the price named for the calendar year in such contracts would not exclude such transactions from the ban on basing points. It could be that additional freight would be added to these tin plate contracts.

Meanwhile the U. S. Steel subsidiaries have advanced the price on tin plate 10 cents per base box.

Tubular Goods . . .

Tubular Goods Prices, Page 125

New York — Applications for 13,515 miles of gas line pipe, involving 3,433,700 tons, were pending before the Federal Power Commission on May 15 of this year, according to compilation recently made by Gas Appliance Manufacturers Association, this city. Since that time one of the projects, the largest and most costly of its kind ever to come before the Commission, has been authorized. This is the line of the Transcontinental Gas Pipe Line Co. from Texas to the eastern seaboard, which will involve an expenditure of more than $150 million and approximately 498,200 ons of line pipe.

During the period of July 1, 1945, to May 15, 1948, the Power Commission authorized construction of 10,168 miles of natural gas pipe line, involving 2,064,600 tons.

Included in gas pipe lines pending are 356 miles of 26-inch pipe for the Panhandle Eastern Pipe Line Co.; 1387 miles of 24 to 30-inch pipe for the Tennessee Transit Gas Co.; 1020 miles of 26-inch pipe for the Texas Eastern Transmission Corp.; and 470 miles of 26-inch pipe for the El Paso Natural Gas Co.

Also pending are 606 miles of 24-inch pipe and 150 miles of 18-inch pipe for the Northwest Natural Gas Co.; 1159 miles of 16-inch trunk line for the Southern Natural Gas Co.; 855 miles of 30-inch and 60 miles of 24-inch line for the Trunk Line Gas Supply Co.; 1530 miles of 26-inch line for the United Gas Corp. (Atlantic Gulf Gas Corp.); and 537 miles of 20-inch line and 39 miles of laterals for the Commonwealth Natural Gas Co.

Semifinished Steel . . .

Semifinished Prices, Page 124

Pittsburgh — There isn't enough semifinished steel available to match the demands coming to the steel mills. Consequently, production of rolled steel is held down proportionately. Settlement of the captive coal mine strike has been followed by resumption of production at open hearths made idle during the period of the strike. Something like 52,000 tons of ingots were lost during the strike by plants of the Carnegie-Illinois Steel Corp. in the Pittsburgh-Youngstown district. Resumption of operations at strike-idled open hearths has improved conditions with respect to semifinished supply, but the increased tonnage is far below the current requirements of the market and will scarcely be noticed.

An important development last week was the increase in prices effected on carbon and alloy ingots, blooms, billets, slabs and skelp by subsidiaries of U. S. Steel.

Basis for quoting alloy ingots has been changed from the gross to the net ton. Adjustment downward in the price was made to compensate for the smaller poundage in the net ton.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 124

Chicago — Suppliers of reinforcing steel are displaying little interest in new inquiry. All assert that they are overcommitted and see little hope of catching up. Tonnage lost by virtue of smaller mill quotas in third quarter has complicated an already bad situation. Most suppliers find themselves unable to accommodate their old-time contractor accounts. While high construction costs are discouraging a good deal of new building and expansion, the volume is beyond the ability of the steel industry to satisfy.

Structural Shapes . . .

Structural Shape Prices, Page 125

New York — While less active than a month ago, structural activity is fairly brisk, with awards featured by the placing of 6515 tons for the Alfred E. Smith housing project, lower Manhattan, with the Bethlehem Steel Co.

Shape prices are advancing with the probability that the situation will become fairly stabilized shortly. It is considered possible in some quarters that shape prices will settle at a point which, along with other increases in building costs, will discourage some work now in prospect. However, fabricators generally have heavy backlogs, with the larger shops booked ahead five to six months.

Triborough Bridge & Tunnel Authority has again applied to the Army for permission to build the world's largest suspension bridge across the Narrows at the entrance of New York harbor, connecting Brooklyn and Staten Island. The proposed bridge would have a center span of 4620 feet, 420 feet longer than the Golden Gate bridge at San Francisco, at present the longest structure of its type in the world. Estimated cost is $75 million, based on present prices. "A tunnel," the Authority says, "is entirely out of the question because of cost and the impossibility of financing."

Boston—What fabricators will ultimately pay for plain material depends chiefly on what the Bethlehem mill establishes as its price. Substantial tonnage comes into this area from Bethlehem on a freight rate to Boston of 48 cents per 100 pounds. Two delivered prices are likely; if the mill base is the same, Bethlehem will have a freight advantage of 19 cents per 100 pounds over Pittsburgh, the latter delivered Boston price now being 3.92c following the advance on standard structural shapes of $10 ton. With the Bethlehem mill price 3.30c on standard structural shapes, the delivered price in the Boston district is 3.78c.

Chicago — Most contracts held by structural steel fabricators carry an escalator clause ranging up to $10 a ton, and this will offset the higher costs created by new pricing and wage increases. Fabricators in this district have enough business to carry them through 1948 on the current steel supply basis; consequently, there is little competition for new work coming out. Some work has been discouraged by high construction costs, but the volume is still more than can be handled.

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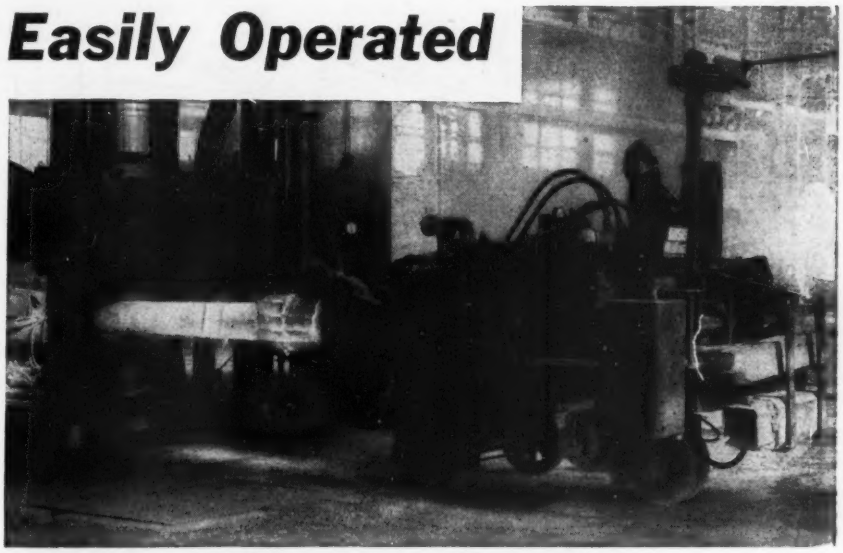

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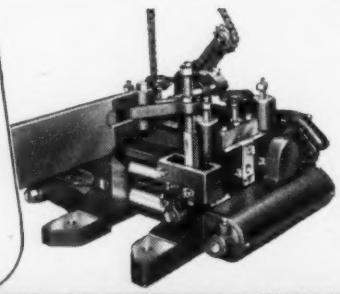

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Advances of $4 a ton posted by several producers. Demand continues heavy

Pig Iron Prices, Page 126

Chicago — Carnegie-Illinois Steel Corp. has advanced pig iron prices $4 a ton across the board, effective July 21, thereby paralleling the action of the leading independent, Pickands, Mather & Co., a week ago. Within the next few days, it is expected that all producers will have announced price increases. Inland Steel Co. on July 19 relighted its No. 6 blast furnace at Indiana Harbor which had been idle since Dec. 23 when it went down for relining and repairs. Following rehabilitation, short coke supply forced holding the unit idle and even now operation is under slack wind. No merchant iron will be available for 30 to 60 days because of the necessity for building up its own iron supply. Carnegie-Illinois has now returned to blast four of the five South Chicago furnaces forced down by an explosion July 3. The fifth stack is being relined. Of the district's 43 stacks, 40 are now in blast. Foundries are suffering for lack of iron and are pressing suppliers to rush shipments. Coke still is short but the situation is improving.

Cleveland — American Steel & Wire Co., announced last week the following new mill prices per gross ton, on its various grades of pig iron produced at its Central Furnaces here:

Basic, $43; foundry, $43.50; malleable, $43.50; bessemer, $44; intermediate low phosphorus, $46.

Prices are subject to seller's current list of extras and deductions and standard conditions of sale. All sales are subject to seller's price in effect at time of shipment.

Birmingham — The clamor for pig iron continues as does the persistent shortage. Two of the district's merchant producers—Sloss-Sheffield Steel & Iron Co. and Republic Steel Corp., announced $4 a ton increases during the week. Woodward Iron Company said it would survey the situation further before arriving at a decision.

New York — District pig iron consumers, with the vacation season over in most cases, are operating to the fullest possible extent. Receipt of raw materials, particularly pig iron, is the major limiting factor. Some foundries are still unable to operate more than three or four days a week, although others manage to get in as many as five days.

Price advances in the East are expected to be announced in the relatively near future, possibly in line with the $4 pattern that has been set up by some of the inland producers. Tennessee Products Corp. advanced charcoal iron prices $4 a ton to $62, f.o.b. Lyles, Tenn.

Boston—Unless more pig iron can be obtained from outside sources, numerous New England foundries may be forced to close before the Mystic furnace can again be brought into production. Various moves have been made to obtain more iron, but any tonnage diverted will be at the expense of other consumers. What

foreign and outside tonnage is in sight is being held for high premium prices. Mystic is expected to be out of blast for at least three months and practically all consumers are caught with low inventories. Melt among jobbing shops is well below last year, but the slag is not sufficient to materially affect the intensified shortage of pig iron.

Philadelphia — Full force of the current uptrend in pig iron prices has not as yet hit this district. Most increases throughout the country to date have amounted to $4 and it is assumed that some such adjustment will be approved by district producers eventually. However, indications are that at least one producer will not take action until early in August, or until in a position to again sell to the merchant trade. At present this producer's merchant stack is down.

Globe Iron Co., Jackson, O., has switched to an fob furnace basis on silvery, no longer basing seaboard shipments on Buffalo.

Advances of $4 by southern furnaces have little direct bearing here as they have long since withdrawn from the local market to all practical intents and purposes.

Cincinnati—Pressure for deliveries of pig iron has been resumed from some melters, indicating the vacation shutdowns earlier in the month have been ended. Deliveries into this district are lagging behind allotments. Casting costs are up, on the recent rise in Northern pig iron and in oven foundry coke, district ovens adding 90 cents to make the delivered price here $21.40. Backlogs of some foundries may be shrinking but the overall, district needs for castings appear as great as heretofore.

St. Louis — Pig iron prices here are unchanged, with producers disavowing any intention of raising, even though their coke prices do not yet reflect the recent coal rise. Only 20 per cent of coke used in iron production here, however, is bought in the open market, the rest being manufactured locally. Iron production will drop by at least 50 per cent July 26, when Missouri Illinois Furnaces Inc. cuts off one of its two furnaces for relining and repairs, probably for two and one-half months. Production has remained at the 1000 ton daily capacity since the war. Output may actually drop to less than half during the repairs, since the furnace in blast will alternate between basic and foundry iron to supply both types of consumers.

Mo-Ill's customers, warned many weeks ago of the impending curtailment, have been fairly successful in lining up new supply sources for the interim. Demand in this district is as heavy as ever, with melters desiring to expand their own production clamoring continuously for more, but suffering no particular hardship in supplying their minimum needs.

Seattle — No pig iron is available and foundries have practically exhausted inventories. Geneva has announced a new price of $40.50 gross on pig, f.o.b. plant, which with freight added will mean approximately $47.63 delivered at Portland or Puget Sound, an increase of $1. However, buyers have no assurance when shipments will be made. Recent deliveries of pig have been offgrade, but it was all that was obtainable here.

Scrap . . .

Scrap Prices, Page 130

Philadelphia—District brokers are now buying open-hearth scrap at an advance in the formula prices of $2.50 per ton, according to some trade leaders, unshipped tonnage against current consumer contracts will be moved at the higher levels.

The $2.50 increase would bring No. 2 heavy melting, No. 1 busheling and No. 1 and No. 2 bundles up to $41.50, delivered, and No. 3 bundles at $39.50, delivered. No. 1 heavy melting steel, which has been holding at $42.50 to $43.50, delivered, is expected to move higher shortly.

New York — Leading brokers have advanced their buying prices $2.50 a ton, now offering $37 for No. 2 melting steel, No. 1 busheling, Nos. 1 and 2 bundles and $35 for No. 3 bundles. No. 1 heavy melting steel is being quoted at $38.50 to $39 f.o.b. shipping point. These changes reflect a change in the pricing formula. All other grades are unchanged momentarily, although turnings and low phosphorus scrap are expected to be marked upward soon.

Chicago — Scrap prices here advanced $2.50 a ton, effective July 23. Growing strength in the market for the past 30 days and the impact of sharply higher finished steel prices announced last week forced steel-

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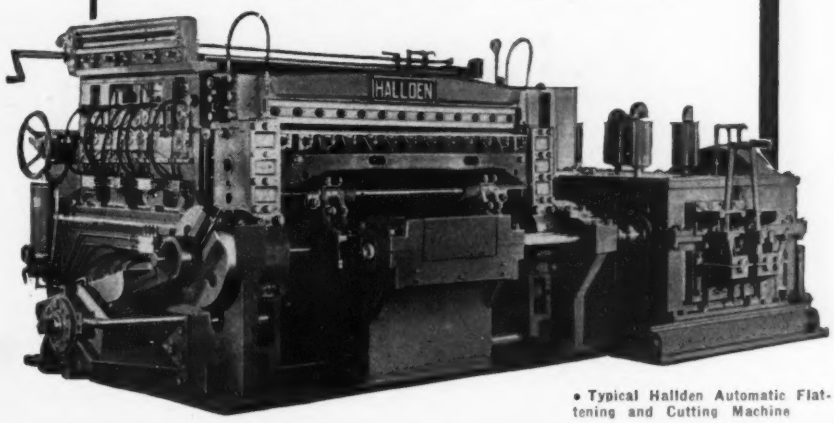

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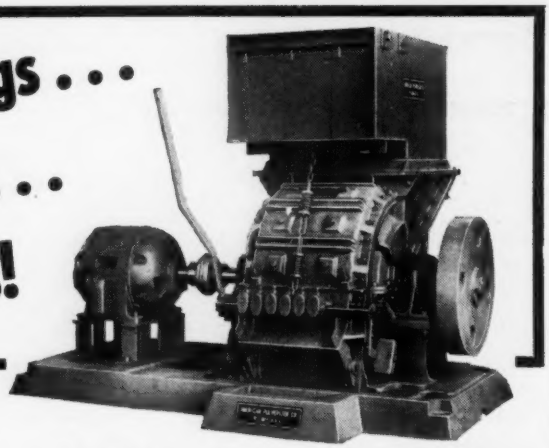

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makers to abandon their firm resistance against upward revision of the price formula. Heavy melting steel now stands at $42 per ton delivered with other grades at usual differentials. For No. 1 railroad heavy melting steel for mill consumption $43 on tracks is offered. Not all of the tonnage of the latter moves to steel mill consumption and some of these non-mill acquisitions still bring as high as $48 a ton delivered. The scrap market was confused following the markup in prices and several days will be required to bring order.

Pittsburgh — Strong tone prevails in the scrap market due to continued pressing demand and dearth of supplies. Practically no buying of volume tonnage is reported, however, and the market at the moment is more or less at a standstill with published prices unchanged from a week ago.

The feeling persists in the scrap trade that something of a market eruption is in the making. This applies especially to the formula prices which have been posted by the mills. Two factors working toward breaking, or at least revising, the present formula are: The fact that the higher prices being put into effect by the steel mills on finished steel products will likely be followed by a demand on the part of fabricators that formula prices be adjusted upward on the scrap which they return to the mills; there is no reason to think scrap trading will be excepted from the general ban on basing point, zone or other uniform pricing methods. The latter issue, it is understood, is to be discussed in detail at a meeting of scrap dealers and brokers in Atlantic City this week.

Boston—Open-hearth steel scrap is moving frequently at over formula prices. Movement of scrap from yards is generally heavier than incoming tonnage and some volume is being held for higher prices. There is also a firmer tone to cast. For clean cupola cast, consumers are offering as high as $65 delivered.

Detroit — Scrap sales have been at a standstill since July 16, pending clarification of the price picture. A $2.50 increase likely will be made across-the-board in the formula price under which mills have been buying open-hearth and electric furnace material. Due to excessive contamination of bundled scrap, one large mill has sent letters to all scrap interests informing them that no bundles will be unloaded until the name of the yard supplying the scrap has been furnished, and that cars will be held on demurrage until such information is given. This presupposes the blacklisting of some yards suspected of loading bundles with concrete, bricks and other nonmetallics.

Cincinnati — Formula prices are still holding on open-hearth grades of scrap. Factors tending toward unsettling of the market are the high bids for railroad offerings, and reported over-formula prices in some other districts. Quotations on foundry grades are higher, partly in sympathy with a recent rise in northern pig iron. Scrap rails are also higher.

Birmingham — Movement of scrap is accelerated somewhat over previous weeks with little general agreement, however, as to prices. Above formula prices are sometimes paid.

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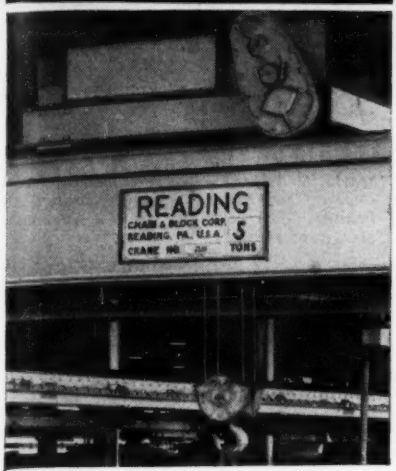

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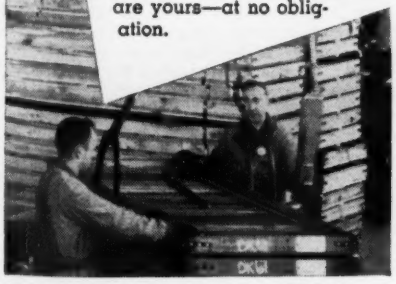

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Warehouse . . .

Warehouse Prices, Page 127

Philadelphia — Leading district jobbers hope to have new price schedules established before the end of this month, notwithstanding current confusion arising from changes in mill prices and in transportation costs, the latter as a result of the shift of producers to a mill or shipping point basis.

Chicago — Warehouses have withheld announcement on price policy pending receipt of additional information on new mill prices. Considerable study will be required because several factors are involved. These include higher mill prices, varying delivery charges depending upon distances between mills and warehouse, and increased handling costs resulting from higher wages.

Cincinnati—Steel jobbers here are withholding announcements on price policies until the situation is clarified. Sources of supply for warehouses in this district are varied and price schedules, when established, will likely show considerable divergence.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 126

Philadelphia — Oven foundry coke has been advanced $1 a ton to $20.50, Swedeland, Pa. ovens and $20.55, Philadelphia ovens.

Birmingham—Because of increased production costs, Alabama By-Products Corp. last week posted an increase of $1.15 a ton on oven foundry coke.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

6515 tons, Alfred E. Smith housing project, lower Manhattan, New York, for New York City Housing Authority, to Bethlehem Steel Co.

3800 tons, stock house and fermentation building, Joseph Schlitz Brewing Co., Milwaukee, to Milwaukee Bridge Co., Milwaukee.

2000 tons, one section, State Van Wyck express highway, Queens, New York, through Arthur Johnson contractor, to American Bridge Co., this is in addition to 900 tons for another section recently noted as going to the same fabricator, through Tully & DiNapoli, contractors.

1450 tons, laboratory addition, General Electric Co., Schenectady, N. Y., through George A. Fuller Co., New York, to Lehigh Structural Steel Co., Allentown, Pa.

1200 tons, galvanized transmission towers, Tacoma Light Department, to Bethlehem Pacific Coast Steel Corp., Seattle.

1000 tons, building, International Silver Co., Wallingford, Conn., to Topper & Griggs Inc., Hartford, Conn.

1000 tons, brew house and office building, Joseph Schlitz Brewing Co., Milwaukee, to Wisconsin Bridge & Iron Co., Milwaukee.

800 tons, Carolina Pulp & Lumber Co., Lumberton, N. C., through Elasco Services Inc., New York City, to Ingalls Iron Works, Birmingham, Ala.

790 tons, bus terminal, Hempstead, Long Island, to Bethlehem Steel Co.

650 tons, building, Atex Realty Corp., Great Neck, Long Island, to Harris Structural Steel Co., New York.

640 tons, apartment, Atex Estates Inc., Great Neck, Long Island, to Harris Structural Steel Co., New York.

345 tons, building, Forstner Chain Corp., Union, N. J., to Bethlehem Steel Co.

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Department W-2

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265 tons, state bridge, Jefferson county, New York, through Collins Bros., to Bethlehem Steel Co.

220 tons, power house, New Orleans, through Ebasco Services Inc., New York, to Ingalls Iron Works, Birmingham, Ala.

250 tons, Long Island Railroad bridge, Laurelton, Long Island, to American Bridge Co., Pittsburgh.

225 tons, storage building, Texas Co., Westville, N. J., to Bethlehem Steel Co.

150 tons, Carborundum plant, Vancouver, Wash., to Pacific Car & Foundry Co., Seattle.

135 tons, Kingsbridge car barn, Third Ave. Transit Corp., New York, to Schacht Steel Construction Inc., New York.

127 tons, Conibear rowing shell house, University of Washington, Seattle, to Isaacson Iron Works, Seattle.

125 tons, Long Island Railroad bridge, Laurelton, Long Island, to Bethlehem Steel Co.

120 tons, Brick Presbyterian Church, East 92nd St., New York, to Schacht Steel Construction Inc., New York.

100 tons, New York Central Railroad bridge, Randall, N. Y., to Lackawanna Steel Construction Co., Buffalo.

REINFORCING BARS . . .

REINFORCING BARS PLACED

210 tons, addition to J. C. Penney Co. store, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; S. S. Mullen, Seattle, general contract.

165 tons, administration building, Seattle School Board, to Bethlehem Pacific Coast Steel Corp., Seattle; J. H. Sellen, Seattle, general contractor.

125 tons, Engineering building, Gonzaga College, Spokane, Wash., to Northwest Steel Rolling Mills Inc., Seattle; Gus Bouten, Spokane, general contractor.

PLATES . . .

PLATES PENDING

4000 tons, steel sheet piling, breakwater at Astoria, Oreg.; bids in to U. S. Engineer, Portland, Oreg., July 21.

850 tons, 4½-mile main pipeline, 30½ and 36½-inch diameter, 7 gage, 3/16-inch, Lewiston Orchards project, Lewiston, Idaho; Goodfellow Bros., Wenatchee, Wash., low to Bureau of Reclamation, Denver, $344,552.

Unstated, two 100,000-gallon water tanks and one 250,000-gallon water tank, on 100-foot towers and 80-foot respectively; alternate wood for tanks; bids to U. S. Engineer, Portland, July 22.

RAILS, CARS . . .

RAILROAD CARS PLACED

Clinchfield, 35 seventy-ton covered hopper cars, to American Car & Foundry Co., New York.

Copper Range, 8 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago; these are in addition to 15 previously ordered.

Delaware & Hudson, 500 fifty-ton box cars and 200 fifty-ton gondola cars, to its own shops.

Grand Trunk Western, 500 fifty-ton box cars, to American Car & Foundry Co., New York, and 200 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Gulf Mobile & Ohio, 500 fifty-ton gondolas, to American Car & Foundry Co., New York; these are in addition to 500 hopper cars recently reported placed with the Bessemer, Ala., plant of the Pullman-Standard Car Mfg. Co., Chicago.

Mather Stock Car Co., 100 forty-ton refrigerator cars, to its own shops.

LOCOMOTIVES PLACED

Texas & Pacific, 11 diesel road locomotives, to Electro-Motive Division, General Motors Corp., LaGrange, Ill.

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CONSTRUCTION AND ENTERPRISE

CALIFORNIA

OLEUM, CALIF.—Union Oil Co. has awarded a $70,000 contract to C. Norman Peterson, 2832 9th St., Berkeley, for improvements in the compounding and packaging plant.

SAN FRANCISCO—Pacific Gas & Electric Co., 245 Market St., will build a $932,000 substation at Bell Ave. and Rio Linda Blvd.

CONNECTICUT

BRISTOL, CONN.—Superior Electric Co., 83 Laurel St., will build a $68,000 factory.

FLORIDA

FLAGLER BEACH, FLA.—Lehigh Portland Cement Co., A. K. Cawley, secretary, Allentown, Pa., plans to build a $1 million plant near here.

WORTHINGTON SPRINGS, FLA.—Clay Electric Co-operative Inc., Keystone Heights, will build a $500,000 diesel electric power plant.

ILLINOIS

CHICAGO—Goodman Mfg. Co., 4834 S. Halsted St., has awarded a $725,000 contract to Sumner S. Sollitt Construction Co., 307 N. Michigan St., for factory additions.

INDIANA

MARION, IND.—Anaconda Wire & Cable Co., Hastings, N. Y., plans to build a 1-story factory and warehouse addition, costing $100,000.

MARYLAND

BALTIMORE—American Radiator & Standard Sanitary Corp., 5315 Holabird Ave., plans to start work this fall on a warehouse, and a cleaning house. These two buildings will contain over 100,000 square feet of floor space. Meanwhile, the company expects to start work shortly on an addition to its sand and storage building.

BALTIMORE—Dixie Metals Co., 1200 Bush St., has completed erection of a plant, containing approximately 8000 square feet, for the production of type and babbitt metal and solder.

BALTIMORE — Westinghouse Electric Corp., 2519 Wilkens Ave., whose local plants are engaged principally in production of industrial electronic and x-ray apparatus, plans to virtually double its repair plant at 4015 Foster Ave. by erecting an addition, containing about 11,000 square feet.

BALTIMORE—L. E. Clements Engineering Corp. has acquired additional floor space in a building to the rear of 1107 East Pratt St., where it is engaged in pattern work and also operates a machine shop for tool and die work. L. E. Clements is president.

BALTIMORE—Caldwell Casting Co. Inc., a new corporation, has equipped space in buildings off Eudowood Lane, Towson, for the production of nonferrous castings. Vernon Caldwell is president; C. F. Koppisch, vice president; and Albert H. Hintenash, secretary-treasurer.

NEW MEXICO

FARMINGTON—Southern Union Gas Co., c/o Burt Bldg., Dallas, Tex., is planning to build a $1 million gasoline plant.

NORTH CAROLINA

WINSTON-SALEM, N. C.—B. & L. Construction Co. will build a ready-mix concrete plant. Estimated cost is $115,000.

OHIO

CLEVELAND—John G. Jergens Inc., formerly the Jergens Co., 17118 St. Clair Ave., will move to a larger plant near E. 116 St. and Miles Ave. The company specializes in man-

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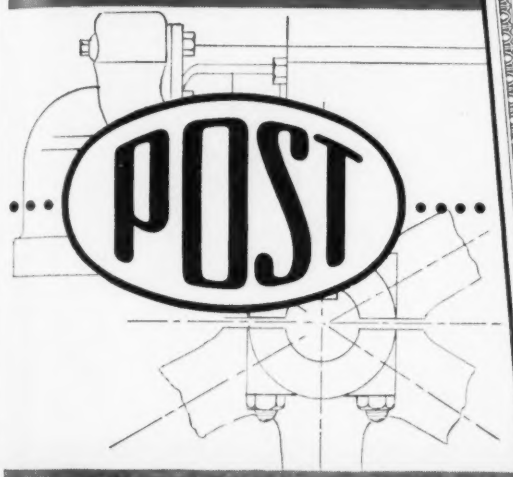

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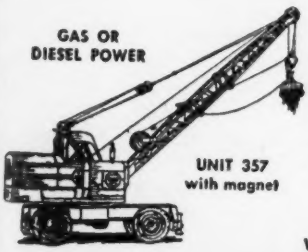

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ufacture of pilot bushings and plans to purchase additional machine tools.

CLEVELAND—Federal Foundry Supply Co., 4600 E. 71st St., is contemplating construction of a $100,000 factory addition.

YOUNGSTOWN — General Fireproofing Co., Walter Bender, president, will begin producing a new line of metal desks which will include 35 models in its recently completed four-story $1 million plant addition.

OKLAHOMA

OKLAHOMA CITY, OKLA.—American Iron & Machine Co., 518 N. Indiana St., plans a $30,000 machine shop addition.

OREGON

NORTH BEND, OREG.—Menasha Coos Head Plywood Corp. plans to construct $2 million plywood plant.

PORTLAND, OREG. — U. S. Engineer has awarded S. Morgan Smith Co., York, Pa., a $5,031,567 contract to fabricate four 111,300 horsepower hydraulic turbines for the McNary dam on the Columbia river near Umatilla, Oreg.

PENNSYLVANIA

MEADVILLE, PA. — Westinghouse Electric Corp., 180 Mercer St., has awarded an $80,000 contract to H. Platt Co., 1104 Sellinger Ave., for erection of a 1-story plant.

NEW CASTLE, PA. — Flex-O-Lator Inc., Carthage, Mo., plans to open a plant here with Fred Platt as manager, manufacturing wire spring pads for mattresses and automobile seats.

PHILADELPHIA—Western Electric Co. Inc., c/o Ballinger Co., 121 N. Broad St., will make a $100,000 addition to its plant at 300 E. Allegheny Ave.

TENNESSEE

NASHVILE, TENN.—Washington Mfg. Co., c/o contractor, has awarded a $75,000 contract to R. E. Dunn & Co., American National Bank Bldg., for a plant addition.

TEXAS

CARTHAGE, TEX.—Texas Gas Transmission Corp. has awarded a $73,500,000 contract to Stone & Webster Eng. Corp., 90 Broad St., New York, for a 840-mi, 26 inch natural gas pipeline from Texas to near Middletown, O. to connect with lines of Ohio Fuel Gas Co., Louisville, Ky., Manufacturers Light & Heat Co., East Ohio Gas Co. and Texas Eastern Transmission Corp., and for construction of compressor stations.

DALLAS, TEX.—Lone Star Gas Co., 1915 Wood St., plans construction of $271,500 compressor units at Gainesville, Knox City, and Sherman.

DALLAS, TEX.—Core Laboratories Inc., W. H. Davison, president, 2151 Fort Worth Ave., plans to construct a $250,000 laboratory.

HOUSTON, TEX.—Reed Roller Bit Co., 5125 Clinton Dr., plans to build a $350,000 masonry shop.

HOUSTON, TEX.—Stupp Bros. Bridge & Iron Co., 3800 Weber Rd., St. Louis, Mo., is planning a steel fabricating plant costing $500,000, and a specialty steel plant, unit and tanks costing $400,000.

McCAMEY, TEX.—Slick Oil Co. and Associated Companies (Urschel Co. and Plymouth Co.), Milam Bldg., San Antonio, plans construction of a $4,000,000 recycling plant.

SWEENY, TEX.—Phillips Petroleum Co., Neils Esperson Bldg., Houston, plans to build a gasoline plant and make other improvements totaling $1,500,000.

WINNIE, TEX. — McCarthy Oil, Gas and Chemical Corp., Sterling building, Houston, has let a contract to Tellepsen Construction Co., 3900 Clay St., Houston, for a chemical or absorption plant. Estimated cost is $1,800,000.

WASHINGTON

TACOMA, WASH.—Tacoma smelter, American Smelter & Refining Co., plans expansion program including new steel buildings, conveyor systems and other improvements.

CANADA

AINSWORTH, B. C.—Yale Mining Co., Bank of Nova Scotia Bldg., Vancouver, plans to erect a 300-ton crushing plant and 150-ton mill at Kootenay Lake Mine. Cost will be over $100,000.

WELDON, N. B. — Atlantic Chemicals Co. Ltd., is contemplating constructing a $4,000,000 plant for producing superphosphates and cement.

HAMILTON, ONT. — Canadian Westinghouse Co. Ltd., 286 Sanford Ave. N., has awarded a $600,000 contract to Frid Construction Co. Ltd., 128 King St. E., for an addition to the west end plant at Aberdeen and Longwood Rds.

HAMILTON, ONT.—Procter & Gamble Co. of Canada Ltd., Burlington St. E., has awarded a $1,860,000 contract to Provo Construction Co. Ltd., P. O. Box 67, for piping, tanks, equipment, and an addition to the boiler house, providing greater production facilities at the plant.

ARVIDA, QUE. — Aluminum Laboratories Ltd., plans to build a $300,000 research laboratory.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Concluded from Page* 127)

e.l. and 0.9c for l.e.l.; Western, add 0.35c for e.l. and 1.5c for l.e.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton let 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ¼ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c c.l. packed 6.05c, ton lots 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.: Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more. 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l., and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Graphidox No. 4: (Si 56%, Ca 5%, Ti 9%) C.l. packed, 16.50c per lb. of alloy; ton lots 17.90c; less ton lots 19.40c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%) C.l. packed, 12.95c per lb. of alloy; ton lots 14.60c; less ton lots 15.85c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.